Program Planning Committee

John Abellera
Associate Research Analyst
Council of State and Territorial Epidemiologists
Atlanta, GA

Rita Altamore
Epidemiologist
Council of State and Territorial Epidemiologists
Washington State Department of Health
Public Health Laboratories
Shoreline, WA

Rosalyn Bell
Public Health Advisor
National Center for Public Health Informatics
Centers for Disease Control and Prevention
Atlanta, GA

David Cardenas
Section Chief
Enterprise Systems Integration Public Health Information Systems
LA County Department of Health Services
Commerce, CA

Marty Cicchinelli
Conference Co-Chair
Senior Advisor, Division of Alliance Management and Consultation
National Center for Public Health Informatics
Centers for Disease Control and Prevention
Atlanta, GA

Yvonne Claudio
Executive Director
National Association for Public Health Information Technology
Rockville, MD

Laura A Conn
Associate Director for Program Development and Integration
National Center for Public Health Informatics
Centers for Disease Control and Prevention
Atlanta, GA

Felicia Dawkins
IT Specialist
National Center for Public Health Informatics
Centers for Disease Control and Prevention
Atlanta, GA

Sterling Elliott
Senior Analyst, Public Health Systems
Association of State and Territorial Health Officials
Washington, DC

Angela Fix, MPH
Conference Co-Chair
Director, Public Health Informatics
Association of State and Territorial Health Officials
Washington, DC

Greg Gauthier
Business Analyst
National Association of County and City Health Officials
Denver Public Health Department
Denver, CO

Michael Hill
Administrator
National Association for Public Health Information Technology
Okeechobee County Health Department
Okeechobee, FL

Program Planning Committee

Marty LaVenture
Public Health Informatics Advisor and Manager
Bureau of Health Protection Minnesota Department of Health
Council of State and Territorial Epidemiologists
Minneapolis, MN

Jennifer Li
Program Manager
National Association of County and City Health Officials
Washington, DC

Denise Love
Executive Director
National Association Health Data Organizations
Salt Lake City, UT

Jan Markowitz
National Association of Public Health Statistics and Information Systems
Silver Springs, MD

Danielle Kahn
Business Analyst
Northrop Grumman
Contractor to Centers for Disease Control and Prevention
Atlanta, GA

Sunanda McGarvey
Business Analyst/Project Manager
Northrop Grumman
Contractor to Centers for Disease Control and Prevention
Atlanta, GA

Michelle Meigs
Laboratory Informatics Program Manager
Association of Public Health Laboratories
Silver Springs, MD

Charles Motes
Laboratory Informatics Program Manager
National Association of County and City Health Officials
Southington, CT

Barb Nichols
Conference Team Lead
Public Health Analyst
National Center for Public Health Informatics
Centers for Disease Control and Prevention
Atlanta, GA

Valerie Rogers
Program Manager, Environmental Health
National Association of County and City Health Officials
Washington, DC

Mary Shaffran
Senior Director of Public Health Programs
Association of Public Health Laboratories
Washington, DC

Lisa Sheppard
Senior Analyst, Public Health Systems
Association of State and Territorial Health Officials
Washington, DC

Patina Zarcone
Director, Strategic Initiatives and Research
Association of Public Health Laboratories
Silver Springs, MD

Sunday, September 24

Time	Session Title	
12:00 PM - 6:00 PM	Registration	Centennial Foyer
5:00 PM - 7:30 PM	Meet and Greet Exhibitors	Grand Hall

Meet and Greet

Please enjoy this opportunity to meet the vendors and other conference attendees in a relaxed low-key atmosphere. Refreshments will be served and entertainment will be provided by the David Freeman Jazz Trio.

Monday, September 25

Time	Session Title	
7:00 AM - 6:00 PM	Registration	Centennial Foyer
7:00 AM - 11:30 AM	Break Area Open	Grand Hall Foyer
8:30 AM - 9:45 AM	Opening Keynote Panel	Centennial III/IV

Opening Keynote Plenary

Moderator: *Dr. Robert Martin, Acting Director, National Center for Public Health Informatics, CDC*

Keynote: The State of PHIN – *Julie L. Gerberding, MD, MPH, Director, CDC; Steve Solomon, M.D., Director, Coordinating Office for Health Information and Service (CCHIS)*

Speakers:

- **Association of Public Health Laboratories –** *Gary Jones, IS Manager, Minnesota Public Health Laboratory*
- **Nation Association of County and City Health Officials –** *Vonna Henry, MPH, Public Health Director, Sherburne County Public Health Department*
- **Council of State and Territorial Epidemiologists –** *Perry Smith, MD, State Epidemiologist, New York State Department of Health*
- **The Association of State and Territorial Health Officials –** *William Hacker, MD, Commissioner, Kentucky Department for Public Health*
- **National Association for Public Health Information Technology –** *David Taylor, MPA, Chief Information Officer, State of Florida Department of Health*

Time	Session Title	
9:45 AM - 11:00 AM	Keynote Panel - RHIOs	Centennial III/IV

RHIO's Panel Presentation

Regional Health Information Organizations or RHIOs support state and other regional projects that help harmonize the privacy and business rules for health information exchange. This panel session opens with an overview of the activities of RHIOS and is followed by individual presentations on RHIO initiatives and collaborative efforts with state and local health departments. There are over 100 regional projects under way that are funded by the Federal government. Several other projects are being supported by private industry efforts or are substantiated by

Monday, September 25

Time	Session Title	
9:45 AM - 11:00 AM	Keynote Panel - RHIOs	Centennial III/IV

State Governors and/or state legislation.

Moderator: *Angela Fix, ASTHO*

Speakers:

- **Regional Health Information Opportunities for Public Health** – *Jac Davies, Inland Northwest Health Services*
- **Health IT, Health Information Exchange, and Public Health** – *Carol Cain, Agency for Healthcare Research and Policy*
- **RHIOs: A View From Indiana** – *Judith Monroe, Indiana State Deptartment of Health*
- **Integrated Information Systems Supporting a Healthy and Safe World** – *Virginia Caine, Marion County Health Department*
- **Collaborative Work with State and Local Health Departments** – *Terry Bazzarre- Robert Wood Johnson Foundation; David Ross, Public Health Informatics Institute*

11:00 AM - 11:15 AM	Break	Grand Hall Foyer
11:00 AM - 5:30 PM	Exhibit Hall Open	Grand Hall Foyer
11:00 AM - 5:30 PM	Software Demo Room	Baker

Software Demo Room

A software demo room will be available for Local and State Public Health Departments to showcase their information system solutions. Please visit the Baker room to sign up for timeslots to use this facility.

11:15 AM - 12:45 PM	Concurrent Session #1	

1.A Perspectives on Early Event Detection — Centennial II

Syndromic surveillance and situational awareness and its role in general surveillance activities nationwide is examined in this presentation. First, syndromic surveillance and its role in general surveillance activities in Michigan will be discussed. In the second portion of the session, a

Time	Session Title
11:15 AM - 12:45 PM	Concurrent Session #1

demonstration of the Kentucky Health Event Network (KHEN) and a discussion of lessons learned will be given. Finally, we will discuss adapting surveillance systems for monitoring influenza.

Moderator: *Richard Hopkins, Florida Department of Health*

Speakers:

- **Syndromic Surveillance – the Michigan Experience** – *James Collins, Michigan Department of Community Health; Rick Keller, Altarum Institute; Brad Carlson, Michigan Department of Community Health*
- **Louisville Community Surveillance for Early Event Detection – An Update** – *Norman O'Banion, Kentucky Department for Public Health; Peter Walton, University of Louisville School of Public Health and Information Sciences; Robert Esterhay, University of Louisville School of Public Health and Information Sciences; Carl Hall, Louisville Metro Health Department; Craig Stanley, Emergint Inc.; Robert Bashore, Technology Consulting, Inc.*
- **Syndromic surveillance-based disease models for influenza control** – *John Brownstein, Harvard Medical School; Barbara Garcia Pena, Miami Children's Hospital; Kenneth Mandl, Harvard Medical School*

1.B Tools for Analysis, Visualization and Reporting of Surveillance Data — Hanover C/D/E

Information systems that provide access to tabular and graphical data views and useful data analysis support for epidemiologists performing disease surveillance activities will be presented. The advantages and challenges faced implementing these systems will be described in addition to an estimate of their value and ability to meet the needs of the system users

Moderator: *Charley Magruder, CDC*

Speakers:

- **Implementation of SAS Enterprise Guide as an Analysis and Reporting Tool in a State-Developed NEDSS System** – *Kirsten Waller, Pennsylvania Department of Health; Sri Seepana, Pennsylvania Department of Health; Kevin McBride, Pennsylvania Department of Health; Suman Kolla, Pennsylvania Department of Health*

Time	Session Title
11:15 AM - 12:45 PM	Concurrent Session #1

- **Integrated Access to Data from the NEDSS Base System, NETSS, TIMS and Other Core Disease Control Data Sources: a Simplified Cost-Free Approach.** *– Eric Brenner, South Carolina Dept of Health & Env Control; Claire Youngblood, South Carolina Dept of Health & Env Control; Jason Collins, South Carolina Dept of Health & Env Control*

1.C Partner Communication and Alerting Systems — Hanover A/B

Michigan, Minnesota, Indiana and Wisconsin have formed a work group to complete a proof of concept of the PHIN Partner Alerting and Communications (PCA) protocols. The live computer demonstration will illustrate how each of the four states have developed web services on their Health Alert Networks (HAN) to send, receive, and confirm receipt from another state's HAN system. The PCA Workgroup, with representation at the local, state, and federal level, will discuss the workgroup's progress on technical, procedural, and policy level issues surrounding PHIN Partner Communications and Alerting. The presentation will also show how the NY State Department of Health (NYSDOH) has leveraged and extended the use of the Integrated Health Alerting and Notification System (IHANS) beyond direct alerting functionality by describing the system, its business rules, functions and the process for intra-application alerting and for deploying the system to other jurisdictions.

Moderator: *Tom Russell, Northrop Grumman*

Speakers:

- **Partner Communications and Alerting Proof of Concept** *– William Colville, State of Michigan; Chuck Berning, State of Indiana; Jason Stull, State of Minnesota; Mark Doerr, University of Wisconsin, Madison*
- **NYS Health Alerting and Notification: Leveraging and Integrating PHIN Standard Technology for Alerting and Communications across the Enterprise and Across Partners in Emergency Response** *– Debra Sottolano, New York State Dept. of Health; Ivan Gotham, New York State Dept. of Health*
- **Partner Communications and Alerting Workgroup Report** *– Robb Chapman, CDC*

Monday, September 25

Time	Session Title
11:15 AM - 12:45 PM	**Concurrent Session #1**

1.D Collaborative Development — Hanover F/G

This session covers the issues and driving forces behind the adoption of the open source software development model and its potential impact on public health. The session describes why and how teams of diverse, geographically dispersed individuals can come together to develop high quality software. Points for discussion include the validity of the open source development model for public health and how the broader public health community should nurture collaboration development of open source public health systems.

Moderator: *John Thomas, Northrop Grumman*

Speakers:

- **Open Source Development for Public Health: A Primer with Examples of Existing Enterprise Ready Open Source Applications.** *– Stuart Turner, University of California Davis Health System*
- **A Collaborative Development Portal for PHIN** *– Mike Perry, CDC*

1.E Making Regional and National Health Information Exchanges Work for Public Health: The Vision of the CDC Centers of Excellence in Public Health Informatics — Centennial I

In this session we will hear from select CDC Centers of Excellence (CoE) in Public Health Informatics. These CoE have been funded to improve the public's health through discovery, innovation, and research related to heath information and information technology. During this panel discussion we will hear about the process and challenges of creating of the National Health Information Network (NHIN). The NHIN is an Internet-based architecture that links disparate health care information systems via uniform communications and a software framework of open standards and policies. The NHIN allows patients, physicians, hospitals, community health centers and public health agencies across the country to share clinical information securely. This series of regional and prototype national projects provide opportunities for unprecedented integration of clinical health information across multiple care delivery organizations.

Moderator: *William Kassler, CDC*

Time	Session Title
11:15 AM - 12:45 PM	Concurrent Session #1

Panelists:

- *Kenneth Mandl, Harvard-MIT Division of Health Sciences and Technology*
- *Richard Platt, Harvard Medical School and Harvard Pilgrim Health Care*
- *William Lober, University of Washington*
- *William Kassler, Centers for Disease Control and Prevention*
- *Sherrilynne Fuller, University of Washington*

1.F Disaster Planning and Recovery — Learning Center

This session highlights initiatives that will support community and region-based disaster planning and recovery activities. The panel points out the need to create integrated patient and activity tracking capacity and to incorporate technology to support both planning and recovery activities.

Moderator: *Marty Cicchinelli, CDC*

Speakers:

- **Integrated Patient Tracking for Pandemic Influenza** – *Judith Woodhall, COMCARE Emergency Response Alliance; Sukumar Dwarkanath, COMCARE Emergency Response Alliance*
- **ROSES - A Prototype Realistic Outbreak Simulator for Exercising Syndromic Surveillance Systems** – *Sean Murphy, Johns Hopkins University Applied Physics Laboratory; Jacqueline Coberly, Johns Hopkins University Applied Physics Laboratory; Jeffrey Lin, Johns Hopkins University Applied Physics Laboratory; Howard Burkom, Johns Hopkins University Applied Physics Laboratory; Brian Feighner, Johns Hopkins University Applied Physics Laboratory*
- **Mobile Communication and Public Health** – *Colleen Monahan, University of Illinois at Chicago; Jose Lacal, Motorola; Freddy Guime, University of Illinois at Chicago*

12:45 PM - 2:00 PM	Lunch on your own

Monday, September 25

Time	Session Title
2:00 PM - 3:30 PM	Concurrent Session #2

2.A Early Event Detection Applications (Analytical Techniques) — Hanover A/B

This session discusses the utility of 911 medical call data with fine spatial resolution for routine space-time cluster detection; the selection of temporal alerting algorithms for syndromic surveillance to achieve reliable detection performance based on statistical properties and the epidemiological context of the input data; and increasing timeliness of detection by compensating for the effects of data availability delays by modeling data availability for a number of Biosense data sources, as well as characterizing the variance of the availability for each data source.

Moderator: *Melinda Wilkins, CDC*

Speakers:

- **Space-Time Cluster Detection Using San Diego County 911 Call Data** – *James Edgerton, Johns Hopkins Applied Physics Laboratory; Howard Burkom, Johns Hopkins Applied Physics Laboratory; Jeffrey Johnson, San Diego County Department of Health and Human Services Agency; Brit Colanter, San Diego County Department of Health and Human Services Agency; Todd Stout, FirstWatch, Incorporated; Kurt Mills, FirstWatch, Incorporated*
- **Data-Adapted Temporal Alerting Algorithms for Routine Health Monitoring** – *Howard Burkom, Johns Hopkins University Applied Physics Laboratory; Jerry Tokars, Centers for Disease Control and Prevention; Nancy Grady, Science Applications International Corporation; Rick Hu, Science Applications International Corporation; Sean Murphy, Johns Hopkins University Applied Physics Laboratory; John Copeland, Centers for Disease Control and Prevention*

2.B Development , Testing and Implementation of Program Area Modules (PAM's) — Centennial II

The National Electronic Disease Surveillance System (NEDSS) project is a public health initiative to provide a standards-based, integrated approach to disease surveillance and to connect public health surveillance to the burgeoning clinical information systems infrastructure. The Programs Area Modules (PAMs) are developed for use with the NEDSS base system for collection and management of information relevant to a disease or condition-specific program. This session gives an overview and update of NEDSS/PAMs and discusses examples of implementation by two different states.

Time	Session Title
2:00 PM - 3:30 PM	Concurrent Session #2

Moderator: *Ruth Ann Jajosky, CDC*

Speakers:

- **Ohio's Experience with Testing the CDC Program Area Modules (PAMs)** – *Robert Campbell, Ohio Department of Health; Scott Danos, CDC; Gary Spencer, Ohio Department of Health*
- **Monitoring the Mumps Outbreak Using the NEDSS Base System, Nebraska, 2006** – *Kashmira Date, Nebraska Health and Human Services/University of Nebraska; Anne O'Keefe, Nebraska Health and Human Services; Tom Safranek, Nebraska Health and Human Services*
- **NEDSS Base System and NEDSS PAM Platform Development** *Wayne Brathwaite, CDC; Scott Danos, CDC*

2.C Improving Utility and Adding Value to Data — Hanover C/D/E

In this session we will discuss methods of applying strategic aberration monitoring to STD surveillance and of facilitating users' ability to identify and correct data capture errors in an electronic surveillance system to ensure accuracy. The session will be completed with a discussion about extending and organizing information available in a spatial data warehouse using Metadata Services.

Moderator: *Linda Mattocks, Northrop Grumman*

Speakers:

- **Strategic Aberration Monitoring (SAM): Using AVR Mechanisms to Improve STD Surveillance** – *Phillip Delcher, Virginia Department of Health; Carrie Dolan, Virginia Department of Health; Jeffrey Stover, Virginia Department of Health*
- **Error Tracking in CHESS: Automated Error Identification and Feedback in the NEDSS Base System** – *Claire Youngblood, Department of Health and Environmental Control; Jason Collins, Department of Health and Environmental Control*
- **Applying Metadata Services to GIS Analyses** – *Carl Kincade, BearingPoint*

Monday, September 25

Time	Session Title
2:00 PM - 3:30 PM	**Concurrent Session #2**

2.D The Convergence of Public Health and Biomedical/Health Informatics — Centennial I

This panel will serve as an introduction of biomedical and health informatics to the PHIN community. Panelists will discuss AMIA's aspirations in the realm of public health and why informatics and public health should converge. Possible topics include but are not limited to secondary uses of data related public health issues, clinical decision support for public health, a discussion of linkage issues between the National Library of Medicine and the CDC, and the state stakeholder perspectives.

Moderator: *Don Detmer, AMIA*

Panelists:

- *Don Detmer, American Medical Informatics Association*
- *John H. Holmes, Ph.D, Assistant Professor of Medical Informatics in Epidemiology at the Hospital of the University of Pennsylvania, University of Pennsylvania School of Medicine, and AMIA Education Committee Chairman*
- *Bryant Thomas Karras, MD, Assistant Professor of Health Services and Biomedical & Health Informatics, University of Washington, Seattle WA*
- *Daniel Janies, Ph.D., Assistant Professor, Biomedical Informatics, The Ohio State University, Columbus, Ohio*

2.E Service-Oriented Achitecture Development — Hanover F/G

Through its focus on both reuse and on the flexible composition of Service Components and Web Services into specific solutions, Services Oriented Architecture (SOA) helps organizations delivers the vision of agile public health business processes by reducing the cost and time needed to make changes. As public health business processes change, the services supporting them can be evolved or replaced. This session will provide an overview of SOA and describe two approaches for using a SOA to enhance Public Health's ability to accomplish its fundamental missions of serving customers (e.g., citizens, other agencies, other levels of government, and industries).

Moderator: *Loran Naugher, BearingPoint*

Time	Session Title
2:00 PM - 3:30 PM	Concurrent Session #2

Speakers:

- **Building a Standards-Based Service Oriented Architecture for the Los Angeles County Public Health Information Network** – *David Cardenas, Los Angeles County; Debashish Mittra, CAL2CAL Corporation; Gora Datta, CAL2CAL Corporation; Abdul-Malik Shakir, CAL2CAL Corporation*
- **SOA Web Services: Data Integration and Linkage for Environmental Public Health Tracking** – *Linh Le, New York State Department of Health; Ivan Gotham, New York State Department of Health; Hongmei Yu, New York State Department of Health; William Hulchanski, New York State Department of Health; Xiaohang Wang, New York State Department of Health*
- **PHIN Architecture** – *John Fitzpatrick, ATSDR*

2.F Excellence in Informatics — Centennial IV

The purpose of this session is to showcase award-winning informatics projects; The University of Arizona BioPortal, the North Carolina Public Health Information Network and the CDC Center of Excellence in Public Health Informatics in Massachusetts. First we will hear about the BioPortal National Center of Infectious Diseases project, then this session will cover an established statewide early event detection system, NC DETECT; the web-based early event detection and timely public health surveillance system in the North Carolina Public Health Information Network. We will also hear from the CDC Center of Excellence in Public Health Informatics in Massachusetts and how they are developing and deploying an application that scans electronic medical records to detect patients with notifiable conditions and to send secure reports to the state health department.

Moderator: *Tom Savel, CDC*

Speakers:

- **BioPortal: Sharing, Analyzing, and Visualizing Public Health Datasets** – *Daniel Zeng, Univ of Arizona; Hsinchun Chen, Univ of Arizona; Chunju Tseng, Univ of Arizona; Ken Komatsu, Arizona Department of Health Services; Lea Trujillo, Arizona Dept of Health Services*
- **Incorporating Lessons Learned from NC DETECT in the Development of a NHIN Prototype Architecure Biosurveillance Use Case In North Carolina** – *Amy Ising, UNC Chapel Hill; James Kaufman, IBM Almaden Research Center; Anna Waller, UNC Chapel Hill;*

Monday, September 25

Time	Session Title	
2:00 PM - 3:30 PM	**Concurrent Session #2**	

Ginny Wagner, IBM

- **Electronic Medical Record Support for Public Health (ESP)** – *Michael Klompas, Harvard Medical School; Ross Lazarus, Brigham and Women's Hospital; James Daniel, Massachusetts Department of Public Health; Gillian Haney, Massachusetts Department of Public Health; Alfred DeMaria, Massachusetts Department of Public Health; Richard Platt, Harvard Medical School*

3:30 PM - 4:00 PM	**Break**	**Grand Hall Foyer**
4:00 PM - 5:30 PM	**Concurrent Session # 3**	

3.A Panel Discussion: Public Health Use of Biosurveillance Systems for Early Event Detection and Situational Awareness-Lessons Learned and Next Steps — Centennial I

Participants of this interactive session will have the opportunity for shared dialogue and information exchange in the areas of monitoring, analyzing, and responding to biosurveillance data. Topics to be discussed may include sharing experiences and lessons learned using various systems; case studies, analytical methods, and protocols for monitoring; communication and investigation. Panel members will include public health experts at the local, state, and federal levels.

Moderator: *Colleen Martin, SAIC*

Panelists:

- *Susan Cookson, Erin Murray, Karl Soetebier, Georgia Division of Public Health*
- *Hwa-Gan Chang, New York State Department of Health*
- *Gabriel Rainisch, Northrup Grumman, CDC BioSense Program*

3.B Integrated Surveillance Systems: Perspectives from Two States — Hanover C/D/E

Public health agencies are working diligently to create a variety of integrated surveillance systems that can transfer and share public health, laboratory and clinical data efficiently and securely between varying electronic systems. This session, with presentations from two large state health agencies (Michigan, and Pennsylvania) will focus on practical experiences of these health agen-

Time	Session Title
4:00 PM - 5:30 PM	Concurrent Session # 3

cies and the methods employed by each to meet the challenge of building integrated surveillance systems that adhere to PHIN data standards. Michigan has designed the Michigan System to Report Integrated Disease Events, MI-STRIDE, which is capable of monitoring human and animal disease occurrence simultaneously.

Moderator: *John Abellera, CSTE*

Speakers:

- **Integration of HIV/AIDS Surveillance into a State-Developed NEDSS System: Lessons Learned From the First Six Months** *– Bonnie Krampe, Pennsylvania Department of Health*
- **The Michigan System to Report Integrated Disease Events (MI-STRIDE): Development of an Integrated Human and Animal Disease Reporting System** *– Whitney Mauer, Michigan State University; John Kaneene, Michigan State University*

3.C Integrated Architecture Approaches — Hanover F/G

A discussion of how an open system with diverse data dissemination and data capture capabilities can provide even greater flexibility in terms of access control, entity reporting, standardizing data elements and vocabulary, improved data quality via enhanced edit checking, dynamic and reusable templates and forms construction while providing continuous situational awareness of an event or critical capacity will be given. The New York Department of Health's (NYSDOH) Health Emergency Response Data System (HERDS), a system for rapid and dynamic deployment of preparedness and response surveys and forms for gathering data during emergency incidents; the California Public Health Information Network (CalPHIN) architecture, including the approach to mapping all potential laboratory messages of interest to LOINC and SNOMED, the deployment of a centralized vocabulary services architecture, and a knowledgebase based on a public health ontology; and the South Carolina Department of Health and Environmental Control's on-going Public Health Informatics program, which develops and implements an integrated informatics infrastructure toward improving health outcomes and public health preparedness, will be demonstrated in this session.

Moderator: *John Fitzpatrick, CDC*

Time	Session Title
4:00 PM - 5:30 PM	Concurrent Session # 3

Speakers:

- **The California Public Health Information Network: A Discussion of the Architecture and Implementation of a Public Health Edge Server within Hospital and Public Health Laboratories** – *Stuart Turner, University of California Davis Health System*
- **Extending the Successes of the NYSDOH Health Emergency Response Data System (HERDS) Integrated Architecture across Diverse Public Health Reporting Environments and Activities** – *Debra Sottolano, New York State Dept. of Health; Ivan Gotham, New York State Dept. of Health*
- **Integrated Informatics Architecture for SC DHEC** – *Guang Zhao, South Carolina Department of Health and Environmental Control*

3.D Business Process and Project Management — Hanover A/B

This session discusses the adaptation of new business processes by public health programs and how state and local health departments struggle with the effective deployment of information technology projects.

Moderator: *Tom Savel, CDC*

Speakers:

- **Project Management in Developing Communicable Disease Public Health Surveillance Systems** – *Hwa-Gan Chang, New York State Department of Health; Jackie Griffin, Keane, Inc; Perry Smith, New York State Department of Health*
- **Implementation of the Public Health Unified Process in Los Angeles County– Application of an IT Project Governance Model in a Local Public Health Jurisdiction** – *David Cardenas, Los Angeles County; Charles Shelby, PHFE*

Time	Session Title
4:00 PM - 5:30 PM	Concurrent Session # 3

3.E Laboratory Data Standardization and Evaluation Criteria for Standardizing Vocabulary for Hospital Pharmacy Data — Centennial II

Presentations will discuss development of a set of data standardization guidelines used to support viable, PHIN-compliant data exchange systems supplying lab-based surveillance. We will explore how these data exchange systems can be implemented in data quality control programs that help guide achievement of PHIN compliance in a manner that maximizes exchange of comparable data between disparate systems.

Moderator: *Cecil Lynch, UC Davis*

Speakers:

- **Laboratory Data Standardization Guidelines Supporting Disease Surveillance** – *Leah Estberg, California Department of Health Services*
- **Evaluation Criteria to Identify Robust Vocabulary Standards for Hospital Pharmacy Data** – *Wenkai Li, CDC; Blaine Mincey, CDC; Kelly Peterson, CDC; Dan Budnitz, CDC; Ben Kupronis, CDC; James Tolson, CDC; Daniel Pollock, CDC; Jonathan Edwards, CDC; Dale Nordenberg, CDC*

3.F NEDSS: Migration, Training and ASP Deployment Model — Dunwoody

Various aspects of the National Electronic Disease Surveillance Systems (NEDSS) and examples of state level electronic disease surveillance systems will be presented. One of the broad purposes for NEDSS, a major component of PHIN, is to enhance both the timeliness and quality of information entered. New Mexico has designed NM-EDSS Training for case investigators with the intent of improving the timeliness and completeness of case investigation information through the use of point-of-contact real-time data entry rather than submission of faxed paper forms. In order to be responsive to the ever-expanding needs of public health preparedness, the State of New Jersey replaced its case-centric, Communicable Disease Reporting System (CDRS) with the patient-centric, Communicable Disease Reporting and Surveillance System (CDRSS).

Moderator: *Roland Gamache, Indiana Department of Health*

Monday, September 25

Time	Session Title	
4:00 PM - 5:30 PM	**Concurrent Session # 3**	

Speakers:

- **NEDSS Training in the Land of Enchantment** – *Jackie Sparks, State of New Mexico*
- **Implementing the NEDSS Base System (NBS) in a remotely-hosted location using a commercial Application Service Provider (ASP): Experiences and Implications for Broader Adoption of this Deployment Model** – *Wayne Brathwaite, CDC; Sally Johnson , Rhode Island Department of Health; Chase Crowson, Computer Sciences Corporation*
- **Preparations to Convert from a Case-Centric to a Patient-Centric System: New Jersey's Experiences Training Users and Migrating Data to the Communicable Disease Reporting and Surveillance System** – *Marlene Bednarczyk, New Jersey Dept. Health and Senior Services*

6:00 PM - 9:00 PM	**Reception**	**Centennial III/IV**

Tuesday, September 26

Time	Session Title	
7:00 AM - 5:00 PM	Registration	Centennial Foyer
7:00 AM - 11:30 AM	Break Area Open	Grand Hall Foyer

7:00 AM - 8:30 AM	Special Interest - #1	

1.A Special Interest - PHIN Messaging System User's Group Meeting — Dunwoody

Come share experiences and learn from some of the largest users of PHINMS as they relate their experiences. The CDC development staff will be on hand to answer questions and directly receive your requests for product enhancements. This meeting is targeted at users of PHINMS.

Moderator: *Tim Morris, CDC*

Panelist:

- *Tom Brinks, SAIC*
- *Tim Morris, CDC;*
- *Hadi Makki, New York City DOH;*
- *John Napoli, New York State DOH;*
- *Alan Scott Baldel, SAIC;*
- *Charles Fisher, New York State DOH*

1.B Special Interest - Countermeasure and Response Administration Partner Workshop — Hanover A/B

Moderator: *Jeanne Watson, CDC*

Version 1.4 of the CRA application will be ready for release in Fall 2006. This workshop will feature a preview of V1.4 along with an interactive discussion with interested partners to solicit input and suggestions for further enhancements.

Tuesday, September 26

Time	Session Title	
8:30 AM - 10:00 AM	National HIT Agenda Plenary	Centennial III/IV

Implementation of National Health Information Technology Agenda - Plenary

The Office of the National Coordinator for Health Information Technology in HHS has initiated several public-private processes to accelerate the adoption of health information technology (HIT) and advance the secure exchange of health information across the U.S. These processes are working together, with the leadership of Secretary Leavitt and the American Health Information Community to achieve the President's goal of widespread adoption of interoperable electronic health records (EHR) within 10 years. This session will include an overview of the National HIT Agenda to be followed by focused presentations on Standards Harmonization and the Certification Commission for HIT.

Standards Harmonization Process - Harmonization of data standards is fundamental to the success of widespread interoperability. The American National Standards Institute (ANSI) has received this award to convene the Health Information Technology Standards Panel (HITSP). The HITSP will bring together US Standards Development Organizations (SDOs) and other stakeholders to develop and evaluate a harmonization process for achieving health IT standards that will support interoperability among health care software applications, particularly EHRs.

Compliance Certification Process - The Certification Commission for Health Information Technology (CCHIT) has received this contract to develop criteria and evaluation processes for certifying EHRs and the infrastructure or network components through which they interoperate.

Moderator: *Laura Conn, CDC*

Speakers:

- **The National Health IT Agenda** – *John Loonsk, Office of the National Coordinator for Health Information Technology, HHS*
- **Standards Harmonization Efforts for Biosurveillance** – *John D. Halamka, Health Information Technology Standards Panel*
- **Certification: A Catalyst for Adoption of HIT** – *Alisa Ray, Certification Commission for Healthcare Information Technology*

Tuesday, September 26

Time	Session Title	
10:00 AM - 10:30 AM	Break	Grand Hall Foyer
10:00AM - 5:30 PM	Exhibit Hall Open	Grand Hall
10:30 AM - 5:30 PM	Software Demo Room	Baker

Software Demo Room

A software demo room will be available for Local and State Public Health Departments to showcase their information system solutions. Please visit the Baker room to sign up for times-lots to use this facility.

Time	Session Title
10:30 AM - 12:00 PM	Concurrent Session #4

4.A Nationwide Health Information Network Prototype Architectures — Centennial I

The Office of the National Coordinator in HHS has established contracts to develop architecture prototypes for how health information network service providers could support the Nationwide Health Information Network (NHIN) initiative. This architecture work is facilitating a move toward secure and portable health information for American consumers. The four consortia are led respectively by Accenture, Computer Science Corporation (CSC), International Business Machines (IBM) and Northrop Grumman. Each consortium is a partnership between technology developers and health care providers in three local health care markets. During this session each group will present their progress toward prototype architectures for secure information sharing among hospitals, laboratories, pharmacies and physicians in the three participating markets.

Moderator: *John Loonsk, HHS*

Speakers:

- **NHIN Prototype Architecture** – *Brian Kelly, Accenture*
- **NHIN Consortia** – *Jared Adair, Computer Sciences Corporation*
- **IBM NHIN Project Update** – *Casey Webster, IBM*
- **Supporting Public Health via NHIN – The Northrop Grumman Consortium** – *Robert Cothren, Northrop Grumman*

Tuesday, September 26

Time	Session Title
10:30 AM - 12:00 PM	Concurrent Session #4

4.B PHIN Requirements Update, Certification Process, Experiences and Web Based Reporting System for Grantees — Hanover A/B

Methodologies used by partners to obtain technical assistance and certification services will be discussed. A review of the services that the CDC offers to partners will be given as well as some success stories. The process of a partner starting with the Technical Assistance Group to work through the 10-step process; formal certification will be discussed. A brief update will be provided on the goals, status and plans for the PHIN Requirements Reorganization effort of 2006.

Moderator: *Lynn Gibbs-Scharf, CDC*

Speakers:

- **PHIN Certification - Where we are Today** – *Don Nestor, SAIC; Philip Baptiste, CDC*
- **PHIN Compliance is not a Project** – *Jason Stull, Minnesota Department of Health; Paul Cavallo, Minnesota Department of Health*
- **Using a Web Based Management Information System to Collect, Track and Assess State and Local Grantee Activities, Compliance and Performance in PHIN Functional Areas** – *Prachi Mehta, CDC*
- **PHIN Requirements Reorganization Status** – *Lynn Gibbs-Scharf, CDC*

4.C International Surveillance in Canada and Ireland, and a Global Disease Surveillance Platform — Hanover F/G

This session will describe the process of developing integrated county-wide information systems for Canada and Ireland. Participants of these projects will discuss the methodology used to guide the process, gather requirements, convene the correct stakeholders, and develop the appropriate flexible tools to enable collection and analysis of real-time data for decision making.

Moderator: *Jason Bonander, CDC*

Speakers:

- **Global Disease Surveillance Platform** – *Taha Kass-Hout, Northrop Grumman Corporation; Leslie Sokolow, Northrop Grumman Corporation; Chris Doyle, Northrop Grumman*

Time	Session Title
10:30 AM - 12:00 PM	Concurrent Session #4

Corporation; Massimo Mirabito, Northrop Grumman Corporation; Hilary Oliphant, Northrop Grumman Corporation; Sandy Althomsons, Northrop Grumman Corporation; Gabriel Rainisch, Northrop Grumman Corporation; Nabil Issa, CDC

- **The Development and Implementation of a Shared National Communicable Disease Reporting System in Ireland** *– John Brazil, Health Protection Surveillance Centre, Ireland; Colm Grogan, Health Protection Surveillance Centre, Ireland; Suzanne Cotter, Health Protection Surveillance Centre, Ireland; Gillian Cullen, Health Protection Surveillance Centre, Ireland*
- **A National Strategy for Health Surveillance Systems in Canada** *– Lisa Zetes-Zanatta, BC Centre for Disease Control; Tim Beasley, Canada Health Infoway*

4.D Presentation of Davies Award Winners - I — Dunwoody

The HIMSS Nicholas Davies Award honors excellance in Organizational, Ambulatory and Public Health IT systems. The session honors the winners of the first two years of the Public Health Davies Award. You will hear about their work and engage in open discussion.

Moderator: *Steve Steindel, CDC*

Speakers:

- **The Benefit of Partnerships to an Immunization Registry** *– Nancy Pare, Utah Department of Health*
- **The Long Road to PA-NEDSS** *– Veronica Urdaneta, PA Department of Health*

12:00 PM - 2:00 PM	Networking Lunch	Centennial II/III/IV
1:00 PM - 4:30 PM	Break Area Open	Grand Hall Foyer

Tuesday, September 26

Time	Session Title	
2:00 PM - 3:00 PM	Poster Session*	Grand Hall
3:00 PM - 3:30 PM	Break	Grand Hall Foyer
3:30 PM - 4:30 PM	Concurrent Session #5	

5.A Enhancing Collaboration through Knowledge Management — Hanover A/B

The process and challenges of developing an interoperable web-based knowledge management dashboard and collaboration system for public health that can support integrated planning, organizing, decision-making and communications among people and organizations at local, regional, state and national levels will be reviewed. This system provides individuals and organizations with real-time visual views of their own progress as well as the progress of those with whom they interact.

Moderator: *Jason Bonander,CDC*

Speakers:

- **A Web-Based Knowledge Management Dashboard and Collaboration System for Aligning Public Health Partners at Local, District, State and National Levels** – *Judah Thornewill, University of Louisville, School of Public Health and Information Sciences; Robert Esterhay, University of Louisville, School of Public Health and Information Sciences; N. Brennan O'Banion, Kentucky Department for Public Health*
- **Integrating Knowledge to Support Public Health Professionals: A Knowledge Networking Approach** – *Radhika Jain, University of Memphis; Balasubramaniam Ramesh, Georgia State University; Kannan Mohan, Baruch College, City University of New York*

5.B Electronic Data Exchange — Dunwoody

This session provides an overview of semantic interoperability principles and is followed by a State-based example of implementing data exchange using clinical document architecture (CDA). California's goal with CDA messages was to develop flexible and easy to implement HL7 RIM-derived messages in compliance with PHIN standards.

Moderator: *Dixie Baker, SAIC*

---

*List of Poster Presentations on page 45. Complete Poster Abstracts follow listing.

Time	Session Title
3:30 PM - 4:30 PM	Concurrent Session #5

Speakers:

- **California Public Health Data Exchange Using CDA Messages** – *Nancy McQuillen, California Dept. of Health Services; Jason Siegel, Atlas Development Corporation*
- **Toward Semantic Interoperability** – *Tim Morris, CDC*

5.C Regional Health Information Organizations — Hanover C/D/E

This session describes Regional Health Information Organizations (RHIOs), whose goal is to improve public health outcomes through the collaborative use of health information. The role RHIOs have in providing data for public health surveillance will also be discussed. The exchange of clinical information will be discussed as it relates to the development of an effective nationwide public health information network.

The Multi-attribute utility theory (MAUT), which provides a method for aggregating different objectives that may be mutually competitive with respect to an overall decision, and how the application of MAUT to RHIO data dictionaries may facilitate identification of appropriate data elements for public health surveillance will aslo be discussed.

Moderator: *Steve Steindel, CDC*

Speakers:

- **Measure Twice, Cut Once: Lessons from the CareSpark RHIO on Public Health Partnerships** – *Mark McCalman, Sullivan County Regional Health Department; Liesa Jenkins, CareSpark; David Reagan, James H. Quillen Veterans Affairs Medical Center; John Dreyzehner, Cumberland Plateau Health District*
- **Business Planning for Exchange of Clinical Data with State and Local Health Departments** – *Laverne Snow, University of Utah Department of Biomedical Informatics; Barry Nangle, Director Center for Public Health Data; Lois Haggard, Center for Public Health Data*

Time	Session Title
3:30 PM - 5:30 PM	Concurrent Session #6

6.A Enterprise Geographical Information Systems (GIS) Implementations — Centennial I

Enterprise GIS implementations to migrate disparate geospatial systems into a unified environment will be discussed. Presenters will demonstrate how the New York State Department of Health has successfully utilized enterprise GIS to provide a compehensive framework to deploy GIS functionality for public health preparedness and response wherever it is needed - desktops, servers, via the internet, or in the field; discuss how the Environmental Public Health Mapper, a collaborative effort between Missouri Environmental Public Health Tracking, the Missouri Hazardous Substances Emergency Events Surveillance Program (HSEES), and the Center for Agricultural, Resource, and Environmental Systems (CARES), provides a dynamic approach for presenting Missouri's environmental public health data; and discuss how the South Carolina Department of Health and Environmental Control (DHEC) has implemented and Enterprise-wide Geographic Information System (GIS) that has fostered transparency in operations and enhanced data integration capabilities on both the environmental and health side of this public health agency.

Moderator: *Virginia Lee, CDC*

Speakers:

- **Using Interactive Web Mappers to Improve Environmental Public Health in Missouri** – *Jeff` Patridge, Information Technology Services Division*
- **Enterprise GIS for Public Health Preparedness and Disaster Management** – *Linh Le, New York State Department of Health; Ivan Gotham, New York State Department of Health; Hongmei Yu, New York State Department of Health; Xiaohang Wang, New York State Department of Health; Derek Cyr, New York State Department of Health*
- **DHEC Enterprise GIS Implementation** – *Jared Shoultz, South Carolina Department of Health and Environmental Control; Guang Zhao, South Carolina Department of Health and Environmental Control*
- **Interactive 3D Visualization of Public Health Geographic Data Using Google Earth** – *David Bliss, University of Washington; Bryant Karras, University of Washington*

Time	Session Title
3:30 PM - 5:30 PM	Concurrent Session #6

6.B Outbreak Management and Countermeasure Response — Centennial II

Examples of the use of CDC Outbreak Management System in a state outbreak and state-developed tools for management of outbreaks and administration of countermeasures will be demonstrated and discussed.

Moderator: *Erin Holt, TN Department of Health*

Speakers:

- **Managing Outbreaks with a Dynamic, PHIN-Compliant Reporting and Surveillance System** – *Marlene Bednarczyk, NJ Dept. Health and Senior Services*
- **Public Health Investigation of Tuberculosis Using the Outbreak Management System Developed by CDC** – *Dr. Marion Kainer, Tennessee Department of Health; Erin Holt, Tennessee Department of Health; Jennifer Ward, Memphis and Shelby County Health Department; Calondra Tibbs, Memphis and Shelby County Health Department; Marty Cicchinelli, Centers for Disease Control and Prevention; Tim Pattison, Northrop Grumman*
- **Necessity = Invention: Repurposing LMS Functionality to Create the Influenza Vaccine Exchange Network** – *Rachel Potter, Michigan Department of Community Health;, Michigan Department of Community Health; Karen Ngowe, Northrop Grumman CITS*
- **Clinic Data Management System - A Countermeasure and Response Administration System** – *John Fuhrman, New York State Department of Health; Leah Matteson, New York State Department of Health*

6.C Staffing the Modern Public Health Informatics Shop — Centennial III

A panel will discuss four competency development activities for public health informatics (PHI), including the informatics component of the applied epidemiology competencies, a work group to define the informatics competencies needed by public health professionals, and an in-progress project to develop competencies for PHI specialists. The new category of public health practitioner, the hybrid information technology-epidemiologist (ITE), which is being developed in response to the need for workers who can manage today's information-intensive and electronic disease surveillance public health environments, will be also discussed.

Moderator: *Denise Koo, CDC*

Time	Session Title
3:30 PM - 5:30 PM	Concurrent Session #6

Speakers:

- **Development and Utilization of Competencies for Public Health Informatics** – *Denise Koo, CDC; Janise Richards, CDC; Bryant Karras, UW Department of Health Services*
- **Staffing the Modern Public Health Informatics (PHI) Shop at the State Health Department – Epidemiologist or IT Specialist?** – *Nancy Barrett, Connecticut Department of Public Health; Rebecca Wurtz, Scientific Technologies Corporation*

6.D CDC Applications-Plans and Update - I — Centennial IV

CDC has developed applications and services for State and Local Health Departments. This session will highlight four of those technology solutions: Countermeasure and Response Administration, BioSense, Partner Communication and Alerting System, Epi-X. Presentations will include a brief overview, followed by status and plans for the future. In addition, the status and plans of the Environmental Public Health Tracking program will be included in this session.

Moderator: *Marty LaVenture, MN Department of Health*

Speakers:

- **Countermeasure and Response Administration** – *John Lindsey, DHHS/CDC; Jeanne Watson, CDC*
- **BioSense** – *Jerome Tokars, CDC*
- **Partner Communication and Alerting System** – *Robb Chapman, CDC*
- **Environmental Public Health Tracking Program** – *Alex Charleston, CDC*
- **Epi-X: Targeting the Message** – *Janet Fath, CDC*

Time	Session Title
4:30 PM - 5:30 PM	Concurrent Session #7

7.A Innovative Tools to Support Public Health — Hanover C/D/E

Innovative tools for collecting public health data, including SPSS tools for the collection of web-based and scanned data, and use of hand-held data collection tools will be demonstrated. The National Center for Infectious Disease implemented SPSS' mrInterview and Dimensions product

Time	Session Title
4:30 PM - 5:30 PM	Concurrent Session #7

line, a web-based survey authoring and data analysis system. The system enables epidemiologists and other pubic health researchers to quickly design, develop, and deploy both web-based and paper-based, scannable forms. A demonstration of the system will be given. Special attention will be given to how web-based questionnaires and paper-based scannable forms are actually developed and deployed. Real-life examples from past outbreak investigations will also be presented.

Moderator: *Rosalyn Bell, CDC*

Speakers:

- **Handheld Based Food Establishment Inspection System** – *David Erikson, Jefferson County Department of Health*
- **Web-based Epidemiologic Data Collection** – *Mark Lamias, SAIC*

7.B Data Modeling and Ontology for Knowledge Management — Hanover A/B

In this session, a review of how PHIN documentation and PHIN LDM can benefit from adopting lessons learned from ontological representations will be given. Discussions will cover major issues within the Knowledge Management movement and, specifically, with the Knowledge Management Reference Model, which is an attempt to diagrammatically and conceptually define all of the major components of Knowledge Management and the interrelationships between each component.

Moderator: *Cecil Lynch, UC Davis*

Speakers:

- **Knowledge Management Reference Model for Public Health** – *Ken Hall, BearingPoint*
- **PHIN Preparedness Ontology: Lessons Learned from Knowledge Modeling** – *Parsa Mirhaji, The University of Texas Health Science Center at Houston; Robert Coyne, TopQuadrant, Inc.; Liju Fan, Ontology Workshop, LLC; Samuel Ward Casscells, The University of Texas Health Science Center at Houston*

Tuesday, September 26

Time	Session Title	
5:00 PM - 6:30 PM	Special Interest - 2.A	Fairlie

2.A Special Interest - Building the Environmental Public Health Tracking Network One Standard at a Time

Moderator: *Patrick Wall, CDC; Nancy Tosta, Ross & Associates*

Time	Session Title	
6:00 PM - 9:00 PM	Special Interest - 2.B	Centennial I/II/III/IV

2.B Special Interest - PHIN Open Conversation – A Facilitated Dialogue for the Future

Moderator: *David Friedman, BearingPoint*

Time	Session Title	
7:00 PM - 10:00 PM	Special Interest - 2.C	Hanover A, B

2.C Special Interest - ELR Birds of a Feather

Moderator: *Rita Altmore*

Descriptions of all special interest and ancillary meetings are located on page 107.

Wednesday, September 27

Time	Session Title	
7:00 AM - 12:00 PM	Registration	Centennial Foyer
7:00 AM - 11:30 AM	Break Area Open	Grand Hall Foyer
7:00 AM - 3:00 PM	Exhibit Hall Open	Grand Hall

7:00 AM - 8:30 AM	Special Interest - #3	

3.A Special Interest - PHIN Requirements Reorganization Review — Dunwoody

CDC will introduce the proposed reorganization of existing PHIN requirements. The proposed reorganization is based on recommendations by partners given through workshops and working groups. Participants are asked to review the reorganization and validate whether it is a better framework for showing how PHIN supports public health activities at the State and local level.

Moderator: *Lynn Gibbs-Scharf, CDC*

8:30 AM - 3:00 PM	Software Demo Room	Baker

Software Demo Room

A software demo room will be available for Local and State Public Health Departments to showcase their information system solutions. Please visit the Baker room to sign up for times-lots to use this facility.

8:30 AM - 10:00 AM	Concurrent Session #8	

8.A Integrated Clinical Management and Implementation of Decision Support — Centennial III

Opportunities for decision support tools, processes, and techniques in public health will be explored and input from the audience on other potential areas of benefit will be solicited. Public Health and Disease Detection in Oklahoma (PHIDDO) system, which debuted July 1, 2004 for external public health partners as a secure, web-based, one-way disease reporting system from hospital infection control practitioners (ICPs) and labs to public health program areas, will be discussed. We will also discuss a case study that examines the use of a clinical decision support system (CDSS) to enhance early clinical diagnosis and to close the gap on reporting

Time	Session Title
8:30 AM - 10:00 AM	Concurrent Session #8

and surveillance of diseases of importance.

Moderator: *Dr. Marion Kainer, Tennessee Department of Health*

- **Case Study: Clinical Decision Support System for CBRN and Acute Pulmonary Infections, Possible Integration of Clinical Data with NEDSS** – *Art Papier, University of Rochester College of Medicine; Veronica Urdaneta, Pennsylvania Department of Health; Jennifer Byrnes MLS, University of Rochester College of Medicine*
- **Decision Support Opportunities in Public Health** – *Nedra Garrett , CDC*
- **Oklahoma's PHIDDO: A System for Disease Detection, Reporting, and Surveillance for State and Local Public Health** – *Lauri Smithee, Oklahoma State Dept of Health; Anthony Lee, Oklahoma State Dept of Health; Mike Crider, L3; Kim Rayno, Oklahoma State Dept of Health; Lindsay Keith, Oklahoma State Dept of Health*

8.B Data Modeling Practices and Principles — Hanover A/B

The three speakers in this session will present various approaches to transforming conceptual and logical information models into functional physical data models in support of differing informatics requirements. A transactional application example will be presented first, including discussions of the decisions made about when to denormalize versus when to retain the native flexibility of the logical data model (LDM) structure, and the impact these decisions had on the application's performance and reporting challenges. The second speaker will discuss the logical-to-physical transformations made when defining data persistence structures for a data warehousing application. This presentation will include a brief review of the benefits of data warehousing and various architectural approaches to data warehousing. The final presentation will offer the audience a glimpse into the future plans for further development, refinement and documentation of the PHIN common information model, and an opportunity to influence the prioritization of subject areas to be addressed in this process.

Moderator: *Karen Chung, Northrop Grumman*

Speakers:

- **Taking the Logical to its Physical Conclusion: What we normalized, what we didn't, and how we coped with those decisions.** – *Sydney Osburn, Jeffrey Sanchez, California Department*

Time	Session Title
8:30 AM - 10:00 AM	Concurrent Session #8

of Health Services; Robert Lutolf, GENSA

- **Refining the PHIN LDM: Baseline Application Data Models to Support PHIN Development** – *Kristi Eckerson, Northrop Grumman*
- **Taking The Logical Model to a Warehousing Solution** – *Vilma Thomas, Northrop Grumman*

8.C PHIN and the Lexical Grid and Using a Standard Vocabulary Service — Centennial I

PHIN Vocabulary Services is collaborating with the Mayo Clinic and OntoReason to enable PHIN Partners to better view and share vocabulary using the Lexical Grid. The Mayo Clinic's Lexical Grid (LexGrid) represents a comprehensive set of software and services to integrate, publish, and access terminology resources. OntoReason provides the representation and implementation of a standard vocabulary service for public health.

Moderator: *Mamie Jennings-Mabery, CDC*

Speakers:

- **PHIN Vocabulary Services**
  - **PHIN VS Initiatives** – *Tim Morris, CDC*
  - **PHIN VS Architecture** – *David Dobbs, SAIC*
- **Use of LexGrid for PHIN Vocabulary** – *Jim Buntrock, Mayo*
- **Implementing Vocabularies Using a Standard Vocabulary Service** – *Eric Schripsema, OntoReason*

8.D Integrated Surveillance and Reporting: the Cancer Program — Hanover C/D/E

Various aspects of the integration of cancer surveillance and reporting data will be discussed. An explanation of the historical and current method of transmitting cancer abstract reports and a description of collaborative efforts and challenges in developing an HL7 Clinical Document Architecture (CDA) implementation guide for the transmission of the cancer abstract, issues that arise from using the SNOMED-CT vocabulary, the successes and challenges of attempting to modify the vocabulary of a mature surveillance system, and the standardization of cancer data collection throughout the nation via hospitals and out-patient care facilities will be presented.

Moderator: *Jennifer McGehee, Northrop Grumman*

Time	Session Title
8:30 AM - 10:00 AM	Concurrent Session #8

Speakers:

- **Cancer Abstract Reports - Moving From a Legacy Transmission Format to a PHIN Compliant Message** – *Ken Gerlach, CDC*
- **Anatomic Pathology Laboratories and Cancer Surveillance: A New Relationship using National Standards?** – *Missy Jamison, CDC; Ken Gerlach, CDC*
- **Implementation of Electronic Pathology Reporting and E-Path Business Rules for Cancer Registration using PHIN Compliant Messaging Standards** – *Scott Van Heest, CDC; Wendy Scharber, Registry Widgets*

8.E Infrastructure Services and Components — Hanover F/G

Unique Records Portfolio, a comprehensive toolkit created by and for public health practitioners used to resolve duplicate records in integrated person-centric health information systems will be reviewed. Fundamental to the success of PHIN component systems is the need to match person specific data from multiple and disparate sources to produce linked data sets or merged records. The identification and resolution of duplicate records has been termed deduplication. Although deduplication services are being added to the NEDSS system, nowhere in the PHIN documentation, standards or guidance is a systematic approach to managing, measuring or tuning deduplication processes. Integration of this information with public health systems will compound the problem unless effective strategies are adopted by public health. Secondly, we will discuss the PHIN Preparedness Cross Functional Requirements require that partner organizations must implement Directory Exchange between other partner organizations. The CDC has developed an implementation guide to help partners implement these requirements. This session will review the implementation guide and walk through a real world example of an implementation between the CDC and a partner organization using utilities developed by the CDC.

Moderator: *Robb Chapman, CDC*

Speakers:

- **Unique Records Portfolio: A PHIN-Usable Guide for Identifying and Resolving Duplicate Records in Integrated Person-Centric Systems** – *Ellen Wild, Task Force for Child Survival and Development; Stephen Clyde, Utah State University; Susan Salkowitz, Task Force for Child Survival and Development*

Time	Session Title
8:30 AM - 10:00 AM	Concurrent Session #8

- **Implementing a PHIN Directory Exchange Solution.** – *Tom Russell, Northrop Grumman*

8.F Integration of Laboratory Information Management Systems — Centennial IV

The processes and challenges of integrating specimen, shipment, test order, and test results information between disparate Laboratory Information Management Systems (LIMS) internal and external to the CDC will be reviewed. This mission aligns with the PHIN initiative to provide a rapid secure transport of laboratory electronic data between the CDC and the PHLs. The intent of the presentations is to lead to a broader discussion and a better understanding of how other organizations in similar situations are addressing these challenges.

Moderator: *Michelle Meigs, APHL*

Speakers:

- **Non-Human Sample Testing in a Clinical LIMS** – *Alok Mehta, Wadsworth Center, NYS Dept of Health; Karen Greene, Wadsworth Center, NYS Dept of Health; Colleen Fleshman, Wadsworth Center, NYS Dept of Health*
- **How STARRS and LUNA Align with PHIN Objectives** – *Brian Levine, SAIC; Emory Meeks, CDC*
- **From Data to Decisions: Laboratory Instrument Integration** – *Brian Levine, SAIC; Emory Meeks, CDC; David Downing, SAIC*

8.G Presentation of Davies Award Winners - II — Centennial II

The HIMSS Nicholas Davies Award honors excellance in Organizational, Ambulatory and Public Health IT systems. The session honors the winners of the first two years of the Public Health Davies Award. You will hear about their work and engage in open discussion.

Moderator: *Steve Steindel, CDC*

Speakers:

- **Davies Award: Clinical Reporting System** – *Theresa Cullen, Indian Health Service; Michele Gemelas, Indian Health Service*

Time	Session Title	
8:30 AM - 10:00 AM	Concurrent Session #8	

- **The North Carolina Disease Event Tracking and Epidemiologic Collection Tool - NC DETECT** – *Anna Waller, University of North Carolina at Chapel Hill; Amy Ising, University of North Carolina at Chapel Hill*

10:00 AM - 10:30 AM	Break	Grand Hall Foyer
10:30 AM - 12:00 PM	Concurrent Session #9	

9.A Notifiable Conditions Knowledgebase: A Joint CDC-CSTE Project — Centennial II

Speakers will review prior CDC and CSTE efforts to create separate databases of notifiable conditions as a baseline for the new knowledge representation effort discussed during this session. This session will discuss the need for an authoritative source of information for which conditions are legally notifiable in certain jurisdictions (state and sub-state) and how jurisdictions differ from the national case definition for specific conditions.

Moderator: *Bill Lober, University of Washington*

Speakers:

- **Notifiable Conditions Knowledgebase: A Joint CDC-CSTE Project** – *Steven Macdonald, Washington State Dept. of Health; Ruth Ann Jajosky, CDC; Cecil Lynch, Division of Medical Informatics, UC Davis; Rita Altamore, Washington State Dept. of Health; William Lober, University of Washington*

9.B Implementation of Vocabulary Concepts to Support Early Event Detection — Centennial I

Partcipants will hear about an enhanced key word search system implemented to support free-text data processing in BioSense. The discussions will cover an investigation of cases with influenza-like illness, to what extent discrete data elements or text processing from a comprehensive electronic medical record could enhance syndrome detection compared to the use of ICD-9 codes only. The session will be completed with an ontology-based chief complaint classification for syndromic surveillance.

Moderator: *Jerry Tokars, CDC*

Time	Session Title
10:30 AM - 12:00 PM	Concurrent Session #9

Speakers:

- **Automated, High-Sensitivity Detection of Cases with Influenza-Like Illness Through a Combination of ICD-9 Codes, Clinical Parameters and Concepts Contained in Free Text** – *Sylvain DeLisle, University of Maryland, School of Medicine; Jill Anthony, Bloomberg School of Public Health; Brett South, University of Utah, School of Medicine; Ericka Kalp, Johns Hopkins Hospital; Shawn Loftus, VA Maryland Health Care System; Robert Sawyer, University of Maryland, School of Medicine; Frank Curriero, Bloomberg School of Public Health; Greg Glass, Bloomberg School of Public Health; Matthew Samore, University of Utah, School of Medicine; Trish Perl, University of Maryland, School of Medicine*
- **Ontology-based Chief Complaint Classification for Syndromic Surveillance** – *Daniel Zeng, Univ of Arizona; Ken Komatsu, Arizona Department of Health Services; Lea Trujillo, Arizona Dept of Health Services; Hsin-Min Lu, Univ of Arizona; Hsinchun Chen, Univ of Arizona*
- **An Enhanced Key Word Search System for BioSense Real-Time Hospital Data** – *Mike Smith, Northrop Grumman; Haobo Ma, CDC; Roseanne English, CDC; Colleen Martin, SAIC; Jerome Tokars, CDC*

9.C Partnerships and Collaboration — Hanover C/D/E

Participants will discuss the Minnesota Public Health Information Network (MN-PHIN), which was formed with the purpose of creating the infrastructure, the policies and the skilled workforce to improve the collection, management, uses, and exchange of timely and accurate data, as well as to improve the design, functions and interoperability of public health information systems across the state. During this session, pariticipants will also hear about the NEDSS NBS Production Support User Group, which provides NBS stakeholders a forum for communication between CDC, CSC, and NBS States and an opportunity for experience sharing between States. Finally, an overview of the BioSense Users Meeting sponsored by CDC in May 2006 will be given.

Moderator: *Sterling Elliott, ASTHO*

Speakers:

- **BioSense Users Meeting: What we learned and next steps** – *Lisa Hines, CDC*
- **NEDSS Base System Production Support User Group – A forum for effective collaboration**

Time	Session Title
10:30 AM - 12:00 PM	Concurrent Session #9

– Doug Hamaker, Texas Department of State Health Services; Stephen Macauley, Computer Sciences Corporation; Scott Danos, CDC

- **Beyond the Technology: A State-Local Partnership to Advance PHIN** *– Martin LaVenture, Minnesota Department of Health; Karen Zeleznak, Bloomington Department of Health*

9.D PHIN Messaging: PHIN MS and the NEDSS Messaging Subsciption Service Dunwoody

Key to success at a PH agency is understanding what business needs PHINMS addresses and how best to integrate applications with PHIN-MS. This presentation will also provide a walk-through of the thought process of an application owner, architect, or a business steward when selecting PHIN-MS as their message transport system. Discussions will include the development of a reliable connection between a hospital's PHIN-MS architecture and a local health department's in-house surveillance system and evaluation of the cost and reliability of this connection. This session will also include a presentation on the new CDC-built NEDSS PAM Platform (NPP), which includes a Message Subscription Service (MSS) module that can be distributed to other public health stakeholders that do not use the NPP. The MSS includes the ability to receive, transform, and deliver electronic messages in numerous formats. This capability will significantly increase public health's ability to exchange electronic messages among trading partners that have not fully adopted existing message exchange standards.

Moderator: *Tom Brinks, SAIC*

Speakers:

- **NEDSS Messaging Subscription Service – A Powerful New Tool for Electronic Message Exchange** *– Scott Danos, CDC; Doug Hamaker, Texas State Health Services*
- **Leveraging BioSense PHIN-MS Hospital Connections for In-House State and County Public Health Surveillance Systems** *– Richard Wojcik, Johns Hopkins University Applied Physics Laboratory; Logan Hauenstein, Johns Hopkins University Applied Physics Laboratory; Nathan Tabernero, Johns Hopkins University Applied Physics Laboratory; Michael Vernon, Cook County Department of Public Health; Matthew Westercamp, Cook County Department of Public Health*
- **Integrating Your Applications with PHINMS** *– Rajashekar Kailar, Business Networks International Inc.; Tim Morris, CDC*

Time	Session Title
10:30 AM - 12:00 PM	Concurrent Session #9

9.E Electronic Reporting of Laboratory Data — Centennial IV

The purpose of this session is to demonstrate both basic and innovative features of the CDC's Laboratory Response Network (LRN) Results Messenger (RM), highlight the importance of the LRN RM in supporting the business needs and policy of the LRN, discuss future enhancements and plans for the application, discuss challenges of developing an electronic laboratory reporting in the state of New York, and Mandating Electronic Laboratory Reporting in New York City.

Moderator: *Emory Meeks, CDC*

Speakers:

- **Five Years of Recruitment of Laboratories for Electronic Reporting in New York State – Lessons Learned** *– David DiCesare, New York State Department of Health; Perry Smith, New York State Department of Health; Hwa-Gan Chang, New York State Department of Health; Megan Saynisch, New York City Department of Health and Mental Hygiene*
- **Mandating Electronic Clinical Laboratory Submissions in New York City** *– Megan Saynisch, New York City Department of Health and Mental Hygiene; Hadi Makki, New York City Department of Health and Mental Hygiene*
- **Enabling Standard Data Exchange for the Laboratory Response Network** *– Jennifer McGehee, SAIC/IES; Emory Meeks, CDC*

9.F A Primer on Health Informatics and Evaluation Strategies for Informatics Projects — Hanover A/B

A comprehensive definition of health informatics and the implication of such a conceptual framework will be presented. A summarization of the major methods of evaluation in three related fields is also offered: public health program evaluation, medical informatics, and information technology, and their bearing on public health informatics.

Moderator: *Tom Savel , CDC*

Speakers:

- **Health Informatics: What Does It Mean?** *– David Potenziani, University of North Carolina*

Time	Session Title
10:30 AM - 12:00 PM	Concurrent Session #9

- **Public Health Issues Management System - Now That We are in Production** – *Mike Davisson, Washington State; Rita Altamore, Washington State*
- **Evaluation of Public Health Informatics Projects** – *Susan Katz, CDC*

9.G Building the Environmental Public Health Network and Integration of Environmental Health Data Systems — Centennial III

This session presents several examples of Environmental Health Data Systems. Integration issues will be discussed as they pertain to environmental surveillance, integrating environmental public health tracking into a disease surveillance system and bringing together clinical case management into Environmental Management.

Moderator: *Judy Qualters, CDC*

Speakers:

- **Building the Environmental Public Health Tracking Network One Standard at a Time** – *Patrick Wall, CDC; Steven Macdonald, Washington State Department of Health; Nancy Tosta, Ross & Associates Environmental Consulting, Ltd.*
- **RASSCLE II; Bringing Together Clinical Case Management and Environmental Management using the PHIN** – *Jeffrey Sanchez, California Department of Health Services; Michael Marchetti, Northrop Grumman*
- **Integration of Environmental Public Health Tracking within a Disease Surveillance System: Connecticut's Electronic Disease Surveillance System (CEDSS)** – *Gary Archambault, Connecticut Dept. of Public Health; Nancy Barrett, Connecticut Dept. of Public Health*

9.H How PHIN Functions Support Public Health Activities — Hanover F/G

This session provides an overview of the PHIN applications and services and offers an opportunity to learn which public health activities are supported by each application and service. In this interactive session, participants will apply their knowledge to determine which PHIN application or service is relevant at each point in the public health scenario.

Moderator: *Tom Morris, CDC*

Time	Session Title	
10:30 AM - 12:00 PM	Concurrent Session #9	

Speakers:

- **How PHIN Functions Support Public Health Activities** – *Linda Mattocks, Northrop Grumman; Tim Morris, CDC; Jennifer Ward, Northrop Grumman*

12:00 PM - 2:30 PM	Lunch on your own	
1:00 PM - 4:30 PM	Break Area Open	Grand Hall Foyer
1:00 PM - 2:30 PM	Concurrent Session #10	

10.A Biourveillance Applications (Analytical Techniques and Reporting) — Dunwoody

Several analytic approaches that can be used with biosurveillance data wil be reviewed in this session. In addition, this session will include a presentation on the New Jersey developed Communicable Disease Reporting and Surveillance System, CDRSS, which provides the ability to immediately report on new and unknown diseases and their accompanying signs, symptoms, and risk factors.

Moderator: Henry Rolka, CDC

Speakers:

- **Early event detection using a PHIN-compliant reporting and surveillance system – New Jersey's CDRSS** – *Marlene Bednarczyk, NJ Dept. Health and Senior Services*
- **Automated Time Series Forecasting for Biosurveillance** – *Sean Murphy, Johns Hopkins University Applied Physics Laboratory; Howard Burkom, Johns Hopkins University Applied Physics Laboratory; Galit Shmueli, Robert H. Smith School of Business, U. of Maryland College Park*
- **Hybrid Probabilistic Modeling and Automated Data Fusion for Biosurveillance Applications** – *Zaruhi Mnatsakanyan, Johns Hopkins University Applied Physics Laboratory; Sean Murphy, Johns Hopkins University Applied Physics Laboratory; Raj Ashar, Johns Hopkins University Applied Physics Laboratory; Howard Burkom, Johns Hopkins University Applied Physics Laboratory*

Time	Session Title
1:00 PM - 2:30 PM	Concurrent Session #10

10.B Analysis and Evaluation of Electronic Laboratory Reporting — Centennial II

The goal of electronic laboratory reporting (ELR) is to enable electronic exchange of laboratory data among public and private laboratory providers and organizations involved in public health. This session details the development, legal mandating, and evaluation of several ELR projects in state and metropolitan jurisdictions, and demonstrates the major features of Washington Department of Health Public Health Reporting of Electronic Data (PHRED).

Moderator: *Pam Meyer, CDC*

Speakers:

- **An Early Evaluation of the NEDSS Base System (NBS) and Electronic Laboratory Reporting (ELR) – Vermont** *– Patsy Tassler, Vermont Department of Health; Gerry Thornton, Vermont Department of Health; Salwa Khan, Vermont Department of Health; June Burr, Vermont Department of Health; Carol Drawbaugh, Vermont Department of Health*
- **Evaluation of Missing Patient Location Information from Electronic Laboratory Reporting in New York** *– Hwa-Gan Chang, New York State Department of Health; Charles Fisher, New York State Department of Health; Boldtsetseg Tserenpuntseg, New York State Department of Health; Dave DiCesare, New York State Department of Health; Candace Noonan-Toly, New York State Department of Health; Perry Smith, New York State Department of Health*
- **Public Health Reporting of Electronic Data - what happened to ELR?** *– Mike Davisson, Washington State; Rita Altamore, Washington State*

10.D CDC Applications-Plans and Update - II — Hanover F/G

CDC has developed applications and services for use by State and Local health departments. This session will highlight four of those technology solutions: NEDSS, Laboratory Response Network Results Messenger, Outbreak Management System and EPI-Info. Presentations will include a brief overview, followed by status and plans for the future.

Moderator: *Marty LeVenture, Minnesota Department of Health*

Time	Session Title
1:00 PM - 2:30 PM	Concurrent Session #10

Speakers:

- **CDC NEDSS Project Plans for 2006 and Beyond** – *Scott Danos, CDC*
- **Laboratory Response Network Results Messenger** – *Jennifer McGehee, Northrop Grumman; Emory Meeks, CDC*
- **Outbreak Management System** – *Robert Hood-Cree, Northrop Grumman*
- **CDC Applications-Plans and Updates (EPI-INFO)** – *Robert Fagan, CDC*

10.E Registry Models: Recommendations and Best Practices through Business Modeling Hanover A/B

This session will cover discussion of an electronic reporting best-practice model for cancer surveillance, representative of hospitals and central cancer registries across the nation; discussion of business modeling techniques used in a project that enabled the development of common approaches and consensus in immunization information systems; and a strong technical infrastructure to support electronic reporting will be described, including a robust method for secure electronic data exchanges with laboratories using the Public Health Information Messaging System (PHINMS).

Moderator: *Jane Sven, CDC*

Speakers:

- **National Program of Cancer Registries – Modeling Electronic Reporting Project (NPCR-MERP) Phase II: Building a National Best Practice Model through Collaboration with the Cancer Registry Community** – *Timothy Carney, Northrop Grumman; Sandy Thames, CDC*
- **Application of Business Modeling Techniques to Develop Recommendations for Management of Immunization Status for Patients in Immunization Information Systems** – *Warren Williams, CDC; David Lyalin, Northrop Grumman, CITS Contract; Susan Salkowitz, Health Information Systems Consultant Principal, Salkowitz Associates, LLC; Jim Aspevig, Montana Department of Health and Human Services*
- **Chronic Disease Reporting Using Communicable Disease Reporting Infrastructure: New York City's Mandate of Hemoglobin A1C** – *Megan Saynisch, New York City Department of Health and Mental Hygiene; Shadi Chamany, New York City Department of Health and Mental Hygiene; Hadi Makki, New York City Department of Health and Mental Hygiene*

Wednesday, September 27

Time	Session Title
1:00 PM - 2:30 PM	Concurrent Session #10

10.F Breakthroughs AHIC Workgroups — **Centennial I**

The American Health Information Community (the Community) is a federally-chartered commission formed to provide input and recommendations on how to make health records digital and interoperable, and assure that the privacy and security of those records are protected, in a smooth, market-led way. Breakthroughs, places where using health IT could produce tangible and specific value to the health care consumer and be realized within a 2-3 year period, were identified and the Community decided to form workgroups in the following four areas: biosurveillance, consumer empowerment, chronic care, and electronic health records. The participants of this session will present an overview of the scope for each of the workgroups and discuss the overall structure, goals, timeline and accomplishments to date.

Moderator: *Angela Fix, ASTHO*

Speakers:

- **AHIC Workgroup Overview** – *Charles N. Kahn, Federation of American Hospitals*
- **Over view of AHIC Workgroups** – *Karen Milgate, CMS*

2:30 PM - 3:00 PM	Break	Grand Hall Foyer

Closing Plenary — **The Future of Health Informatics**

Moderator: *Marty Cicchinelli, CDC*

Speakers:

- *Robert Martin, M.D., CDC, Acting Director National Center for Public Health Informatics*
- *Don E. Detmer, M.D, MA, President and CEO, American Medical Informatics Association*
- *Craig Feied, M.D., National Institute for Medical Informatics, Washington Hospital Center*

5:00 PM - 7:00 PM	Special Interest - 4.A	Executive Conference Rm 219

Poster Abstracts

Poster Session Summary

PS1.A **CDC Unified Process (CDC UP)**
Peggy Joyner, MBA

PS1.B **Utilizing Current Infrastructure and Applications to Support Integration of PHIN Concepts across Public Health Domains**
Julian P Buckmaster

PS1.C **Mulit-Attribute Utility Theory for Prioritizing Data Elements for Surveillance Using Regional Health Information Organization Data**
Jason N. Doctor, PhD

PS1.D **Data Analysis and Reporting from the Outbreak Management System During Deployment for Tuberculosis**
Marion A. Kainer

PS1.E **Enhancing Vaccine Safety Initiatives in Immunization Information Systems Using HL7 Data Exchange**
Ron S. Van Duyne

PS1.F **myPublicHealth: Research in Public Health Knowledge Management to Support Evidence-Based Practice**
Debra Revere

PS1.G **Building Public Health Capacity through OpenCourseWare**
Sukon Kanchanaraksa, PhD

PS1.H **CDC's Controlled Health Thesaurus: A Formal Evaluation**
Mamie Jennings Bell

PS1.J **Collaborative Standardization of Usability Factors**
Debra L. Martin

PS1.K **Collaborative Interoperability Using Web Services within a Service Oriented Architecture Model - Mayo Clinic LIS Succession Project**
Venk K. Reddy

PS1.L **Software Testing and Quality Assurance - How to Know Your IT System Has Hit the Mark!**
David Cardenas, MPH

PS1.M **Features of Existing Laboratory Information Systems and PHIN Readiness**
Stuart Turner, DVM

PS1.N **2006 Assessment of State Capacity in Two Areas: Analysis, Visualization and Reporting of Data and Geographic Information Systems**
Jane Suen

PS1.O **Application of SAS/Intrnet Software for Enhanced Analysis, Visualization and Reporting of Data from the NEDSS Base System, Nebraska, 2006**
Kashmira Date, Rob Rohrbough, Anne O'Keefe, Thomas Safranek

Poster Abstracts

Poster Session Summary

Poster Abstracts

Poster Session Summary

PS1.A CDC Unified Process (CDC UP)

Peggy Joyner, MBA[1]; Tom Savel, MD[2]; Dan Vitek[3]
[1]*BearingPoint,* [2]*Centers for Disease Control and Prevention (CDC),* [3]*BearingPoint*

The challenges of successfully delivering projects on time and within budget and meeting business objectives are enormous. Industry research from the Standish Group — based on analysis of roughly 40,000 projects – shows only about 34% of projects are successful. For its part, the federal environment's volatility and complexity increase the difficulty of project delivery success: Rapidly changing federal regulations and requirements and complex federal budgeting and funding processes create a need for a common repository of tools and processes to assist project managers in navigating towards project success.

The Centers for Disease Control and Prevention (CDC) both understands and has risen to these challenges by developing the CDC Unified Process (UP), a collaborative effort undertaken by all Centers Institutes Offices (CIO). A CDC UP Work Group was established and chartered, under the direction of the Informatics Executive Council (IEC), to provide a clearly defined approach to successful project management and delivery. With the National Center for Public Health Informatics (NCPHI) facilitating, the work group defined nine guiding principles for CDC UP development and established a design group of representatives from each CIO charged with creating it. During the development stage, the work group engaged CDC process owners, project managers, and other stakeholders to identify and document agency regulations and compliance mandates and project management industry leading practices.

While the CDC UP is not a System Development Life Cycle (SDLC), it is a clearly defined approach to successful project delivery that (a) uses a series of scalable project components that facilitate consistent and repeatable project delivery, (b) can be applied to any project to increase project management practice and process efficiency and effectiveness, (c) supports project managers by providing project management tools and components that are easily accessible via the CDC UP website, and (d) continues to evolve as processes and federal regulations change. Artifacts include the CDC UP framework, and numerous process guides, practice guides, templates, checklists, and more.

The CDC UP Project Management Framework is an architecture based on industry-leading standards designed to promote strategic alignment throughout the CDC. It incorporates and integrates Goal Management Portfolio Management, program management, and project management disciplines across the CDC. UP process guides help project teams comply with fed-

eral regulations, PHIN, and CDC policies and standards by presenting requirements in a consistent, easy-to-understand format. One key UP tool, a process guide assessment, provides project managers with a list of processes that will need to be included in their project planning. UP practices guides are brief documents describing background requirements, best practices, and key terminology of industry-leading project management practice and accompanying templates. UP templates are standardized documents with a preset format that are used as a starting point for project management documents to ensure consistency across projects. UP templates are designed to be customized for each project and include instructions and boilerplate text to make them useful to project teams. UP checklists are brief documents listing items to be noted, checked, remembered, and delivered when completing an accompanying template. Other tools include a mapping of the UP Project Management Framework to generic and industry SDLCs; a project classification schema that helps project managers determine the correct amount of project management rigor and documentation to apply to their project; a process assessment guide that identifies which regulatory and compliance processes need to be reviewed; and more.

In July 2006 the CDC UP began an aggressive awareness program with the launch of the CDC UP website and briefings to CDC senior management, CIOs, and general staff.

Please visit the CDC UP Web site at http://www.cdc.gov/cdcup/.

PS1.B Utilizing Current Infrastructure and Applications to Support Integration of PHIN Concepts across Public Health Domains

Julian P Buckmaster
CDC/OD/OCSO Contractor (Northrop Grumman)

Introduction:
Public health entities face many collaboration obstacles, not the least of which is the method of information exchange. With the World Wide Web Consortium's (www.w3.org) publication of Simple Object Access Protocol (SOAP) version 1.2 just three years ago, Web services standards are just now truly reaching an implementation point. But other ways to exchange information are already in place and can provide a secure environment that could be leveraged to foster adoption of PHIN standards prior to implementation of a Web services solution.

General Principles:
CDC has used CITRIX as a remote access tool for several years, which has allowed CDC personnel to log in to servers behind the CDC firewall from remote locations. The newest version, CITGO, is much more robust and has allowed the CDC to expand the types of remotely accessible applications, ranging from Microsoft Office Suite to a complicated, server-intensive specimen management application. Other forms of remote access are also available through the current CDC infrastructure. The implications? As long as a user has Internet access, tools that the user is familiar with can be made available in any type of situation: field surveillance, clinical surveillance, outbreak management, etc. In the near term this existing capability could provide another vehicle for collection of specimens and epidemiological data or laboratory/LIMS-related data.

Benefits:
PHIN standards that deploy existing internal systems to the field could be used to prototype PHIN-related concepts/data/software and enhance the standards and future products. Earlier exposure to PHIN standards can help support wider community acceptance of procedures and the concept of data sharing across related public health domains. It introduces PHIN to a wide user base that already has a planned PHIN integration path to interoperability sooner than would be possible by relying solely on Web services implementation. CDC and public health staff would have real-time transfer and access to data. Finally, it could support time-critical public health surveillance initiatives.

ASTRO as a Proof-of-Concept:
ASTRO 21C is an enterprise specimen management system that administers physical specimen data-related organizational data, such as project and epidemiological data. It can be utilized to collect unlimited outbreak-related information using its EPI subsystem, including test orders and diagnoses. ASTRO 21C is one of the enterprise laboratory systems that is scheduled for integration with STARRS to enable data sharing across the enterprise. In addition, PHIN standard interfaces are being developed for ASTRO 21C to support PHIN data exchange standards and specific requirements of current CDC tools such as StarLIMS and future tools such as STARRS. Work on STARRS integration has begun. The ASTRO 21C development team has used the STARRS interface control document to prototype messages and a Web services interface. However, with the estimated timeline for integration with STARRS through Web services extending well into the next quarter or beyond, the development team began to look for other ways ASTRO 21C could expand its exposure to its current user base. After contacting the CITGO services group, the development team was able to have an ASTRO 21C instance installed on their server. The team did extensive testing to determine if there was a loss of functionality, latency issues, or data corruption when using ASTRO 21C through CITGO. To date, there have been no issues. The results of the tests imply that by using CITGO to access ASTRO 21C, field staff can enter all specimen data and ship to other locations, such as CDC. They can forward detailed epidemiological data with the specimens. CDC can monitor shipments and have advanced knowledge of incoming specimens as well as testing needs. The results of the tests also imply that many of the current PHIN compliant systems could also gain additional external exposure within the public health community through a similar arrangement.

PS1.C Mulit-Attribute Utility Theory for Prioritizing Data Elements for Surveillance Using Regional Health Information Organization Data

Jason N. Doctor, PhD[1]; Mark W. Oberle, MD, MPH[2]; Sherrilynne Fuller, PhD[3]; William B. Lober, MD[4]; Jac C. Davies[5]; Janet G. Baseman[6]

[1]*University of Southern California School of Pharmacy,* [2]*University of Washington School of Public Health and Community Medicine,* [3]*University of Washington Health Sciences Libraries and Information Center,* [4]*University of Washington School of Medicine,* [5]*Inland Health Northwest Health Services,* [6]*University of Washington Department of Epidemiology*

Regional Health Information Organizations (RHIOs) have the potential to provide a variety of data for public health surveillance. But two factors make choosing RHIO data elements that are appropriate for surveillance a daunting task: (1) RHIOs typically collect and aggregate tens of thousands of clinical, financial, and administrative data elements, presenting a rich and potentially confusing schema, and (2) the selection of specific data for surveillance data depends on multiple public health practitioner objectives; data may need to be relevant, timely, complete, and accurate – four characteristics that may be at odds with each other in the clinical world where data may be of varying quality and may be generated at different times through different processes for different purposes).

Multi-attribute utility theory (MAUT) provides a method for aggregating different objectives that may be mutually competitive with respect an overall decision. The MAUT method provides "utilities" that reflect numerically a decision-maker's preference for different multi-attribute decisions. In the present context, the decisions have to do with choosing the data elements best-suited to a public health surveillance task. Thus, application of MAUT to RHIO data dictionaries may help identification of appropriate data elements for surveillance.

In general interactions between objectives pose the greatest challenge to the application of MAUT; such interactions lead to complex models and difficult-to-measure utilities. We propose a condition — the zero condition — which is self-evident in syndromic surveillance and leads to a tremendous simplification of multi-attribute utilities. Preferences for acquiring data elements for surveillance satisfy the zero condition if all data elements are equally preferred when a single objective is not met (i.e., the objective is met at a "zero" level). For example when two data elements are 0% complete, it does not matter that one is more relevant or timely than the other. This phenomenon suggests a multiplicative rule for computing multi-attribute utilities, because multiplication by zero nullifies all differences. We will discuss how a multiplicative multi-attribute utility model can be formally tested and introduce methods for measuring the utilities of data elements through tradeoff exercises. Finally, we will discuss how one can prior-

itize data elements in large RHIO data dictionaries to best meet public health surveillance objectives.

PS1.D Data Analysis and Reporting from the Outbreak Management System During Deployment for Tuberculosis

Marion A. Kainer[1], MD, MPH, Medical Epidemiologist; Calondra Tibbs[1], Erin Holt[1], and Jennifer Ward[2]
[1]Tennessee Department of Health, Nashville, Tenn. and [2]Northrop Grumman

Introduction:
In 2005 the Outbreak Management System (OMS) — a component of the Public Health Information Network (PHIN) created by the Centers for Disease Control and Prevention's National Center for Public Health Informatics (NCPHI) — was deployed in Memphis, Tenn. to manage data collected during the course of a complex tuberculosis investigation. Data on cases, contacts, and investigation activities were captured in a Microsoft SQL database using a pre-release version of OMS 1.1.53.

During the investigation, public health staff needed real-time report and analysis capability to assist in management of the investigation. We will discuss the methods used to extract and analyze data from OMS during this TB investigation.

Methods:
During the TB outbreak, the OMS core captured demographics, investigation characteristics, exposures, and relationships between entities (persons and locations), while outbreak-specific data regarding the investigation, laboratory testing, risk, and treatment were captured using supplemental question sets.

In OMS, data are available in the analysis and reporting tool (Microsoft Access) in the form of views, and custom views can be created and exported for analysis using queries. Reports can also be created in Access to complement the standard reports available in OMS. Due to the frequency and type of analyses needed, the local epidemiologists utilized the external analysis functionality of OMS, specifically ODBC (Open Database Connectivity) with SAS (a product from SAS Institute).

Initially, multiple views were joined in SAS, manipulated, and exported back into Microsoft Access for report generation. Each report had different needs, so the team created multiple datasets in SAS, resulting in a duplication of data. Eventually data were manipulated in SAS and exported to Microsoft Access in a normalized form. Joins were created in queries in Access to produce needed reports, eliminating the need for multiple data tables in SAS. This same methodology can be accomplished directly in the OMS Analysis and Reporting Tool.

However, by using SAS, the group was able to perform additional analyses. Using code created in SAS, they re recoded and exported data in dfb format for geocoding in a GIS (geographic information system) (ArcView by ESRI) and for use in social networking software. In addition, they performed frequencies and other more complex statistical analyses in SAS.

Results:
Using data captured with OMS, the group created line listings and reports, allowing for efficient prioritization and tracking of case and contact follow-up. Accessing the data using SAS, Microsoft Access, and ArcView allowed for effective and efficient automated report generation and data analysis. The team minimized joining of data views in SAS to prevent duplication of data; instead, joins were created in queries in Microsoft Access for producing reports. The use of an ODBC interface with SAS eliminated the need for exporting multiple views from the OMS Analysis and Reporting Tool. The local jurisdiction was not able to export data from the OMS Analysis and Reporting Tool directly due to the loss of the Global Unique Identifier (GUID) when using Microsoft Access 2000 (in comparison with Microsoft Access 2003).

Conclusion:
The Outbreak Management System allows for multiple analysis options, both within the OMS Analysis and Reporting Tool and with external applications such as SAS and ArcView. Other applications, such as EpiInfo and SPSS, can also be used through the same ODBC-connectivity outlined in this abstract. Multiple analysis options allows for customization to meet local needs. In this example, local epidemiologists were able to use their tools of choice for data analysis.

Finally, the simplicity of creating queries and custom reports in Microsoft Access allows less-experienced statistical software users to extract basic information from the data.

PS1.E Enhancing Vaccine Safety Initiatives in Immunization Information Systems Using HL7 Data Exchange

Ron S. Van Duyne[1], **Supervisor, Grants Management; Kevin Garnett**[1]
[1]*CDC Immunization (IZ)/IZ Info Systems Support*

Introduction:
Vaccine safety concerns have become more prominent in recent years with the continued success of immunization programs in reducing vaccine-preventable diseases. The Vaccine Adverse Event Reporting System (VAERS) is the nation's main sentinel system for detecting post-marketing vaccine safety concerns.

We will explore how Immunization Information Systems (IIS) can also work to enhance vaccine safety by providing more accurate and timely reports to VAERS and denominators for calculating VAERS reporting rates, as well as promoting and adopting Health Level 7 (HL7) standards. CDC is designing and implementing electronic VAERS reporting and Vaccine Adverse Event (VAE) 'Alerts'. The project strives to utilize the American National Standards Institute (ANSI) standard HL7 electronic messaging and the Public Health Information Network (PHIN) Messaging System (PHIN MS) secure electronic messaging.

Methods:
To implement electronic VAERS reporting, we have completed a review of the detailed message structure and options needed to report VAERS information from IIS; updated mapping of VAERS manufacturer codes and antigen codes to the standard HL7 code sets used by IIS (MVX and CVX); evaluated secure transfer and receipt parsing and entry of individual VAERS reports; and plan to issue an update to the HL7 Implementation Guide for use by IIS.

Results:
An updated sample HL7 VAERS message has been tested and deemed to be acceptable with minor modifications. An HL7 sender transmitted the message and an HL7 parser reads the message and generated an acknowledgement message to the sending entity. Data element specifications meet the basic message structure of HL7 IIS and VAERS reporting needs.

Conclusions:
These capabilities can increase the accuracy, timeliness, utility, acceptability, and sensitivity and security of the VAERS system, and enrich vaccine safety initiatives for immunization programs in the US.

PS1.F myPublicHealth: Research in Public Health Knowledge Management to Support Evidence-Based Practice

Debra Revere, Ann Madhavan, Ann Marie Kimball, Ann M. Turner, Paul F. Bugni, Sherrilynne Fuller
University of Washington

Introduction:
Supporting public health preparedness for prevention as well as emergency response requires reliable access to relevant, high-quality, and up-to-date information. Public health workers need information systems that are (1) interconnected both locally and nationally; (2) populated with high-quality authoritative information resources that rapidly respond to the information needs of various public health roles (e.g., epidemiologist, public health nurse, etc.); and (3) provide access to evidence-based information that is synthesized from multiple resources.

myPublicHealth is a CDC-funded research program to study public health information needs in support of evidence-based practice underway at the Center of Excellence in Public Health Informatics at the University of Washington. The group is studying the appropriateness, availability, and utility of a variety of public health information resources — including tools, datasets, directories, and alerts to fulfill public health information needs — as well as optimal approaches to retrieval and presentation through application of metadata standards. The group has identified numerous challenges, including interoperability of system components with resources and flexibility of development platform. Research to-date has focused on (1) conducting a comprehensive review of the literature regarding public health practitioner information needs and (2) collaborating with public health practitioner groups to identify roles and information access practices.

During our session, we will describe our research findings and the approaches we took to overcome challenges, and share next steps in the process.

PS1.G Building Public Health Capacity through OpenCourseWare

Sukon Kanchanaraksa, PhD
Johns Hopkins Bloomberg School of Public Health

For the past 10 years, the Johns Hopkins Bloomberg School of Public Health (JHSPH) has used the Internet to offer public health courses to students and public health practitioners worldwide. The school enables students to acquire an MPH degree or public health certificates by successfully completing online courses, and it has also created a course management system (CMS) to organize content for students enrolled in on-campus courses. In 2005 the school joined the OpenCourseWare (OCW) movement and began publishing content from on-campus and online courses to the OCW Web site. Self-learners, educators, and practitioners can access these materials free of charge. These three opportunities — although distinct — support the school's mission: protecting the health and saving the lives of people everywhere. Now, students worldwide can access public health knowledge from JHSPH faculty at the level that best suits their demands, needs, and means.

In this presentation, we'll focus on using a CMS to facilitate OCW publishing, and examine the technical and institutional issues that can arise with OCW publication.

To facilitate publishing course content to OCW, we added a feature to our CMS that allows faculty to simply publish a partial or full course directly to OCW. We also created Cold Fusion templates to incorporate the selected content into various Web pages. Before publishing to the public Web site, we check the copyright status on all images or objects; create new illustrations, if necessary; and publish the final files in HTML or PDF format (we sometimes post audio lectures as MP3 files).

Usage statistics (hits) of all OCW courses suggest increasing interest in public health content from the United States as well as other countries). Almost 20,000 unique visitors visit the JHSPH OCW site each month, and although the effectiveness of OCW in the public health field is still unknown, we at JHSPH believe that it is a moral imperative to provide equal and open access to the information and knowledge that our faculty possesses.

On a global scale institutions are developing software and tools that facilitate the development of a new OpenCourseWare Web site: The Sakai Project has a component that provides CMS tools to publish course content for open access. Open access through OpenCourseWare Consortium is an opportunity to extend the access of public health knowledge not only to public health practitioners, but also to self-learners and educators throughout the world. Public health institutions owe it to themselves and to the world community to explore the value of this undertaking.

PS1.H CDC's Controlled Health Thesaurus: A Formal Evaluation

Kathryn Lesh, Mamie Jennings Mabery
CDC, National Center for Public Health Informatics

This presentation will address the methodology and results of a formal survey of CDC's Controlled Health Thesaurus and the planned modification and expansion of the Thesaurus based on analysis of the survey results.

Introduction:
Since 2002 the Centers for Disease Control and Prevention (CDC) has been developing a Controlled Health Thesaurus (CHT) for standardizing the public health terminology needed for meta-tagging CDC web content. The CHT is a taxonomy of concepts and terms appropriate to public health and specifically to cdc.gov. Many concepts have text definitions. Where appropriate, the concepts are linked to synonymous concepts in other standard terminologies such as MeSH, SNOMED CT and LOINC.

Use of the CHT in conjunction with Documentum has begun in earnest this past year. CDC subject matter experts tagging their documents see the concepts from the CHT for each metadata field. If they do not see their desired concept they can request the addition of a concept. Many times a synonymous term exists in the CHT and that information is provided to the tagger. At this time, taggers do not see the synonyms. Steps are being taken to address this issue.

Use of the CHT by the taggers is one method of validation of the CHT, but a more in depth evaluation is desired. Several criteria for medical terminologies can be found in the literature (Cimino, Hripcsak, Johnson and Clayton, 1989; Cimino, Clayton, Hripcsak, and Johnson, 1994; Campbell, Carpenter, Sneiderman, Cohn, Chute, and Warren, 1997; Cimino, 1998; Elkin, Brown and Chute, 2001). Examples of criteria are domain completeness, non ambiguity, non redundancy and synonymy. While some criteria can be evaluated using automated methods, many require manual review by experts.

Methodology:
Evaluation of terminologies is touted as a necessary part of development. However, there is a dearth of tools available to perform an evaluation. A tool developed for the evaluation of conceptual models (Poels, Maes, Gailly and Paemeleire, 2004; Maes, Poels, Gailly, and Paemeleire, 2005) was adapted for use in the evaluation of the CHT. The tool attempts to answer four questions:

1. Is the CHT perceived by public health professionals as useful?
2. Does the CHT adequately reflect the public health domain?
3. Does the CHT adequately support the information needs of public health professionals?
4. Is the CHT easy to use?

Potential evaluators have been identified and will be sent an email asking for their participation. Once the potential evaluator agrees to participate, the URL of the CHT will be provided. The survey is to be completed via Survey Monkey.

Results:
The evaluations are to be done the summer, 2006 and the results presented at PHIN 2006.

References:
Campbell, J. R., Carpenter, P., Sneiderman, C., Cohn, S., Chute, C. .G, & Warren, J. (1997). Phase II evaluation of clinical coding schemes: completeness, taxonomy, mapping, definitions, and clarity. CPRI Work Group on Codes and Structures. Journal of the American Medical Informatics Association, 4(3), 238–251.

Cimino, J. J. (1998). Desiderata for controlled medical vocabularies in the twenty-first century. Methods of Information in Medicine, 37(4-5), 394-403.

Cimino, J. J, Clayton, P. D., Hripcsak, G, & Johnson, S. B. (1994). Knowledge-based approaches to the maintenance of a large controlled medical terminology. Journal of the American Medical Informatics Association, 1(1), 35-50.

Cimino, J. J., Hripcsak, G., Johnson, S. B., & Clayton, P.D. (1989). Designing an introspective, multipurpose controlled medical vocabulary. Annual Symposium on Computer Applications in Medical Care; Washington; DC (USA); 5-8 Nov. 1989. pp. 513-518. 1989.

Elkin, P. L., Brown, S. H., Chute, C. G. (2001). Guideline for health informatics: controlled health vocabularies—vocabulary structure and high-level indicators. MedInfo;10(Pt 1):191-5.

Maes A., Poels G., Gailly F. and Paemeleire R. (2005). Measuring User Beliefs and Attitudes towards Conceptual Models: A Factor and Structural Equation Model. Retrieved DATE from Ghent University, Management Informatics Research Group Web site: http://www.feb.ugent.be/fac/research/WP/Papers/wp_05_311.pdf

Poels G., Maes A., Gailly F. and Paemeleire R. (2004). Construction and Pre-Test of a Semantic

Expressiveness Measure for Conceptual Models. Retreived DATE from Ghent University, Management Informatics Research Group Web site: http://www.FEB.UGent.be/fac/research/WP/Papers/wp_04_257.pdf

PS1.J Collaborative Standardization of Usability Factors

Debra L. Martin
SAIC

Public Health Informatics is provided as technology tools to a broad spectrum of users. Public Health participants utilize these applications for detection, analysis, visualization, monitoring, reporting, management, planning and data exchange. In many—if not most—cases, individual users must experientially understand multiple applications to process disparate types of information.

These applications may need to be accessed without training and without time for a leisurely learning curve.

To facilitate near-immediate ability to interact with Public Health Informatics technologies, it is critically important to develop, communicate and collaboratively incorporate enterprise-level usability standards.

1. Definitions of Usability and Accessibility
A. Aesthetics: psychological impact of color choices and design standards
B. Intuitive design: logical presentation of necessary components
C. Accessibility: Section 508 standards incorporated as usable aspects of GUI

2. Importance of Enterprise-level Standards
A. Allowing users to apply prior learning to use of multiple applications
B. Comfort-level of users
C. Freeing developers from determining ad hoc design standards

3. Technologies and Processes Related to Usability
A. Development tools and applications
B. Documentation of design standards
C. Sharing consistent components & navigation structures

4. Verifying Usability and Accessibility
A. Understanding the user base
B. Developing requirements and business cases
C. Validating requirements
D. User testing and the onus of rework

5. Usability Success Stories
A. Statistical numbers
B. Examples

These standards, called human factors, understood and provided by Human Computer Interface (HCI) professionals, include an awareness of psychology, barriers to learning, disabilities, processing logic, intuitive methods, as well as adaptive technologies, delivery methods, browser standards, programming limitations and testing processes.

Broad user adoption of PHIN applications, across all disciplines, may be advanced by identifying and incorporating HCI standards for usability and accessibility.

PS1.K Collaborative Interoperability Using Web Services within a Service Oriented Architecture Model – Mayo Clinic LIS Succession Project

Venk K. Reddy, Kevin Swank
Mayo Clinic

Laboratory Medicine and Pathology at Mayo Clinic consists of Intramural (inpatient & outpatient), Extramural, and Clinical Trials and consists of multiple site locations. A huge volume of tests are performed each year with double digit growth expected in the next five years. The diversity of testing is also increasing. The practice requires results and information from multiple laboratories to be integrated for correct diagnosis and interpretation.

The scope of the LIS Succession Project is to replace the aging laboratory systems in the Department of Laboratory Medicine and Pathology at Mayo Clinic Rochester (MCR), Mayo Clinic Arizona (MCA), Mayo Medical Laboratories – New England and selected research areas to meet their information technology needs for the next ten years. A composite solution will be developed collaboratively with a number of new and existing vendors as an integrated laboratory enterprise model on a services oriented architecture (SOA) model. An SOA provides a flexible infrastructure to manage the laboratory business processes. This composite solution can be extendable to Mayo Clinic Jacksonville or the Mayo Health System as needed.

The LIS Succession Project will provide a highly available, resilient and robust laboratory information infrastructure to serve the Mayo practice, education and research missions. This integrated interoperable suite of laboratory applications will minimize the risk to patient safety by:

1. Providing tools for positive patient identification at the point of care, 2. Enabling electronic data capture to reduce manual entry of results, 3. Enabling tools for decision support at the time of test order entry and test result entry, 4. Providing robust messaging for delivery of result reports, 5. Providing the capacity to support test volume growth, 6. Enabling more effective interoperable laboratory practice in Rochester as well as across the Mayo enterprise, 7. Increasing compliance with regulatory requirements by adding functionality to facilitate 21 CFR 11, CDC, FDA, CAP, JCAHO, and Medicare compliance, 8. Increasing organizational effectiveness and decreasing operational costs by standardizing business and laboratory practices, 9. Timely data mining to support research and the development of new tests cannot be accomplished

The LIS systems and other interrelated applications at the Mayo Clinic in Rochester are being replaced by modern IT systems and applications that run web services on an enterprise service

bus (ESB). The legacy systems at Mayo support a huge volume of test data for its practice and reference lab. The new architecture being proposed to replace the legacy system includes an ultra modern ESB to support a number of vended applications exposing web services. With this technology Mayo will not only be able to handle a much greater test volume but also increase productivity and quality of patient care.

PS1.L Software Testing and Quality Assurance – How to Know Your IT System Has Hit the Mark!

David Cardenas, MPH; Charles P. Shelby
Los Angeles County Department of Public Health

The CDC's Public Health Information Network (PHIN) initiatives have established a process for certification that requires state and local health jurisdictions to align with standard system requirements. As projects become more complex and span across multiple functional areas, how does a Health Department know their application is ready for production deployment and is aligned with the needs of its users as well as the functional requirements set forth by CDC? What assurances does a Health Department have that a system that has been developed or implemented will work to accomplish the tasks that the Health Department needs?

In this presentation, representatives of the Los Angeles County Department of Public Health, in coordination with its technology management partner, PHFE, will discuss how software testing has become a critically important component of local software development efforts and the implementation of large-scale information technology projects.

The presentation will review the following concepts:

WHAT IS SOFTWARE TESTING?
The presentation will review the process of verifying and validating that a software application or system works, as expected, and meets the business and technical requirements that guided its design and development.

The three main objectives of testing (verification, validation, and defect finding) will be discussed. The presenters will focus on how:

- The verification process confirms that the software meets defined technical specifications.
- The validation process confirms that the software meets the business requirements.
- A "defect" or variance between the expected business requirements and actual system behavior is catalogued and tracked.

WHY DO SOFTWARE TESTING?
The presentation will review the reasons why it is necessary to test software and identify "bugs" or defects. Specific examples will be cited in order to provide instances where defects in soft-

ware have resulted in enormous costs and impact.
The presentation will review the goals of software testing and address common concerns raised by IT project teams during software development efforts such as:

- Does the system really work as expected?
- Does it meet the users' requirements?
- Is it what the users expected?
- Do the users like it?
- Is the system compatible with our other systems?
- How does the system perform?
- Will it scale to the needs of the organization as more users are added?
- Which areas need more work?
- Is the system ready for release?

In addition, the presentation will review the benefits of software testing processes including reduction in costs, overall improvement in system quality, user satisfaction, and identification of critical training needs.

The presentation will also focus on some of the key components of the testing process and the application of testing procedures to public health IT environments. Some of the components that will be discussed include:

- Business requirements
- Functional design requirements
- Technical design requirements
- Regulatory requirements
- Programmer code
- Systems administration standards and restrictions
- Public Health standards
- Hardware configuration

Finally, the presenters will review the critical components of a software testing and quality assurance team needed to ensure the highest overall quality possible. The presentation will review the key Players and their roles including:

- Business sponsor(s) and partners
- Project Managers
- Software developer(s)

- Testing Coordinator(s)
- Tester(s)

In conclusion, software testing plays a vital role in enabling Health Departments the ability to determine if an application is ready for production. This presentation hopes to explore the critical process of software testing and quality assurance and how it relates to the successful deployment of Public Health systems and applications.

PS1.M Features of Existing Laboratory Information Systems and PHIN Readiness

Stuart Turner, DVM; Ulrike (Riki) Merrick, MPH
University of California Davis Health System

We conducted a retrospective review of features or components of known laboratory information systems (LIS) and how they stack up against emerging PHIN (Public Health Information Network) certification requirements. We used data collected from the Laboratory Information Systems Review of the November edition in CAP Today with permission by Dr. Raymond Aller. Although most of this information is self-reported, it does provide a preliminary look at the relative compliance of existing systems. We hope it also encourages continued work towards the use of PHIN certification requirements as a basis for a more detailed and objective evaluation of system abilities in futures studies.

Key Performance Measures: Looking at the different Key Performance Measures (KPM) prepared by PHIN, as well as the PHIN preparedness functional areas, we find the majority of LIS vendors claim they can provide PH data in the required format. All LIS allow the use of bar-coded collection labels, which will help with specimen tracking as well as "Identifiers & Linkage" requirements. The average installation saturation per LIS is 88%. Other Identifiers & Linkage requirements also seem to be well represented. All LIS can use an HIS interface for results reporting, with an installation rate of nearly 60% and most LIS (98%) have ADT (Admission, Discharge, and Transfer) data capability, however the average installation rate is at 60%, with a range from 3 to 100%.
HIPAA: Most LIS support HIPAA standard transaction formats with an average installation rate of approximately 73%.

Semantic and Syntactic Interoperability (LOINC, SNOMED, HL7): 70% of LIS claim to have LOINC index fields, but only 8% of systems currently provide dictionaries for new installs. 58% of systems support the use of SNOMED and 65% claim to support "Open System Standards", but only 42% of the Vendors claiming support explicitly list HL7 under that category. Therefore, the percentage of systems that are actually HL7 compliant is unclear; it could be as low as 28%.

Chain of custody: The support for use of bar-coded collection labels, which all LIS vendors offer enjoys as well established installation rate of 88%. The ability to manage & track specimens is available in 70% of systems with an equally high installation rate of 67%.

Public health: Self reported ability for public health reporting is highest for conditions associated with microbiology results. But there is an apparently large discrepancy between self-reported

abilities and actual implementation. 65% of LIS claim to be able to report in general, however actual installs are only at 15%. Public health reporting for other notifiable diseases shows that 58% of vendors claim they can in theory report other notifiable conditions, but the feature is only installed in 9% of working applications. For tumor registries, reports numbers are worse with 50% claiming support and 6% installed respectively.

PS1.N 2006 Assessment of State Capacity in Two Areas: Analysis, Visualization and Reporting of Data and Geographic Information Systems

Jane Suen, Lesliann Helmus, Perry Smith, Amy Biel, John Abellera, Nicole Standberry, Charles Magruder
CDC

A three part national survey of 50 states and selected cities is planned in 2006 to assess electronic disease surveillance systems capacity. It was developed by the Council of State and Territorial Epidemiologists (CSTE) National Electronic Disease Surveillance System (NEDSS) subcommittee and Public Health Informatics Team. The CSTE requested that the Public Health Information Network (PHIN) analysis, visualization, and reporting (AVR) user group develop and recommend 10 questions regarding general AVR and Geographic Information System (GIS) capabilities.

This session will present results from the national survey addressing these two topics of interest: analysis, visualization, and reporting capacity, which includes Geographic Information System capacity in state health departments. A pilot study has been conducted with the participation of ten states. We analyzed the data in the AVR and GIS areas and report some of the pilot study findings here.

In the AVR area, we received only 2 positive responses to the question “Has your agency developed visualization dashboards to reflect key performance indicators?” However, all 8 of 8 states responded that they were currently analyzing the information they received to complete special studies beyond the customary, standard reports. The responses were split evenly (4 of 8 states) when the pilot states were asked if their organization routinely provided current public health statistics to the general public via the internet within 7 days of completing the analyses.

In the GIS area, the majority of states (6 of 8) responded that their organization has an established process for geocoding databases. All the pilot states that responded (7 of 7) indicated that they had 1 or more dedicated GIS staff available at their health department. The data from the national survey of 50 states will be collected and analyzed.

We will present results from the full study which will be useful in assessing national AVR and GIS capacity as states implement standards-based integrated systems that meet PHIN standards.

PS1.O Application of SAS/IntrNet Software for Enhanced Analysis, Visualization and Reporting of Data from the NEDSS Base System, Nebraska, 2006 NEDSS (National Electronic Disease Surveillance System)

Kashmira Date[1]; Rob Rohrbough[2]; Anne O'Keefe[3]; Thomas Safranek[3]
[1]Nebraska Health and Human Services/University of Nebraska, [2]Rohrbough Systems Design, Inc, [3]Nebraska Health and Human Services

Application of SAS/IntrNet Software for Enhanced Analysis, Visualization and Reporting of Data from the NEDSS Base System, Nebraska, 2006 NEDSS (National Electronic Disease Surveillance System) is a critical component of CDC's PHIN (Public Health Information Network) initiative. The NEDSS Base System (NBS) was developed by CDC (Centers for Disease Control and Prevention) in collaboration with CSC (Computer Science Corporation) to provide states a PHIN compliant system for disease surveillance, analysis, and reporting. Nebraska implemented the NBS in January 2003 to collect epidemiologic data on a wide range of reportable public health conditions. In addition to establishing an integrated data collection system, the vital element of PHIN (Public Health Information Network) is to provide data for analysis, to assess disease trends, identify risk factors, guide prevention, and assess the impact of interventions. The data collection effort will be of limited value if the data is not made available in usable formats to public health epidemiologists.

The current NBS–AVR (Analysis Visualization Reporting) functionality allows users to access data through the report module of the application, and Reporting Database (RDB) of NBS. The report module supports the production of a limited number of reports, but lacks the ability to present the data to users in enhanced formats like charts, graphs and maps. Also, the existing features and deficiencies in the reports make the task of analysis challenging. Extracting customized data from the RDB is complex and requires skills in manipulating and analyzing complex databases with applications such as SAS. Most local/regional health departments lack the time and resources needed, thereby limiting their access to data. The work load at several local health departments requires them to have access to their data in high quality, user-friendly, point-and-click formats while maintaining the flexibility to view pertinent data in a variety of modes. This functionality is largely deficient in the existing NBS. We have therefore identified the need to enhance our reporting capability to fulfill the requirements of the end-users.

As the first step in enhancing the AVR (Analysis, Visualization and Reporting) functionality of the NBS, we developed intuitive flat-file data extracts from the RDB, which are relatively simple to use from an end-user perspective and provide high quality data for epidemiologic analysis. We further provided users access to simple tables and more complex drill down reports

based on program area and jurisdiction. Next, we have piloted the use of the SAS/Intrnet software to provide users access to high quality, point-and-click formats, and dynamic reports with minimal or no programming requirements. We have hired the services of an independent SAS consultant to assist in developing an application to use the SAS/Intrnet software to surface epidemiological data to a web browser for dynamic analysis. We have achieved considerable success on this front and we propose to describe this functionality in further detail. SAS/IntrNet, a mature and proven technology for the deployment of Web solutions, provides access to the power of SAS data analytics software. It provides real-time access to information using web-browsers and is supported across a variety of platforms. Our stakeholders can produce ad hoc reports in a point-and-click environment to get the information they need, and in an advanced and secure AVR mode. The tool provides a predetermined menu of the most frequently used reports, and the flexibility to select the report formats, in the form of drill-down reports, charts, graphs, maps and tables. Users also have the ability to select the data they wish to analyze as well as a specific format for data tables such as spreadsheets, PDF or HTML files, with the capability to import data to other data analysis tools like SPSS, SAS or Epi-info.

The use of SAS/Intrnet is proving to be successful in fulfilling most of the AVR needs of our public health epidemiologists and end-users. Furthermore, there have been several advantages – 1) SAS/Intrnet license is included with the SAS software licensed through CDC, thereby eliminating the need to procure additional software licenses, 2) Cost-effective. Being a web-based client applications software, there is no need for expensive individual installations and maintenance, 3) Supports advanced security options to provide protected data access, 4) The tool requires minimal or no programming skills and efforts on the part of public health workers, and ensures timely and reliable information, thereby reducing the need for workforce training, 5) The application satisfies almost 90% of our identified requirements, and provides the flexibility to incorporate new information on an ad hoc basis.

PS1.P Event/Communication Component of a Regional Surveillance System

Wayne A. Loschen, MS[1]; Rekha Holtry, MPH[1]; Jacqueline Coberly, PhD[2]
[1]*John Hopkins University Applied Physics Laboratory,* [2]*John Hopkins University Bloomberg School of Public Health*

Introduction:
Versatile, user-friendly visualization tools are required to organize the wealth of information available to users of large, regional surveillance systems into a coherent view of population health status. Communications components must allow multiple users of the same system to share information about the health of their populations in an organized fashion and facilitate communications among jurisdictions.

The Johns Hopkins University Applied Physics Laboratory (JHU/APL) has developed a communications tool to be used within the regional surveillance system in the National Capital Region (NCR). This abstract describes this new communications component that is designed to encourage and facilitate communication between multiple jurisdictions using a common surveillance system.

Objectives:
The objective is to create a capability within the existing system that allows information to be shared easily, thoroughly, and in a timely manner, while gathering the knowledge needed to improve the entire system in the future. The functionality of this communication component must balance the utility of immediate situational awareness with the long term benefits of capturing critical information, such as system usage patterns and user response behavior, which can be used to develop future system enhancements.

Methods:
To meet these objectives, an event / communication feature was designed and developed by a team of epidemiologists and software developers that allows individuals to express concerns about specific events, situations, and statistical detection algorithm outputs. This prototype tool is embedded within the regional surveillance system and provides a forum in which users can write free text comments, rate events based on level of concern, and attach hyperlinks to other screens in an effort to relay pertinent information to others. These capabilities aid in resolving specific health alerts at both the local and regional levels.

In addition to meeting the immediate needs of users for better awareness of the community's current health situation, this component also enables the information gathered to be used for the

future enhancements of the overall disease surveillance system. For example, algorithm developers can view the communications logs to better understand and compare which detection alarms were met with concern versus those that were dismissed. This knowledge can aid in the future refinement of alerting algorithms.

Results:
Initial user feedback of the prototype has suggested modifications for future iterations of the event / communications component. Collaboration between JHU/APL and the health authorities in the NCR has allowed the definition of features that have enhanced the day-to-day communications of the users and allowed better awareness of a situation during a suspected outbreak. The system uses data collected during exercises and the component's initial use will allow algorithm developers' access to data that was not previously available. The component and overall surveillance system will continue to evolve and adapt to the users' needs for better event tracking and communication capabilities.

Conclusions:
With the ability to monitor larger amounts and variety of data than ever before, health monitors need the ability to communicate information about the health of their populations with other health monitors in the region. Realizing this and the benefits of collecting user information electronically in a form that can help the future enhancements to disease surveillance systems, the development team at the JHU/APL gathered user input and devised the initial version of an event / communications component and placed it in a regional biosurveillance node. This new component addresses all five business processes that show how disease surveillance technology may be improved as described within the PHIN requirements. This capability will enhance Detection and Monitoring by allowing algorithm developers new data to use to develop better detectors. It provides better Analysis tools by giving users improved information about what is occurring in surrounding regions. It provides a discussion arena for questions to be asked and answered supporting the Information Resources and Knowledge Management process. The primary focus is to support Alerting and Communications capabilities in a disease surveillance system. And finally, it supports a more coordinated Response across multiple jurisdictions. Incorporating capabilities such as the Event / Communications System within standards can greatly contribute to the advancement of PHIN.

PS1.Q Disease Registration: One Size Does NOT Fit All

Tim E. Aldrich, Karrin Reinheimer, Kelly L. Cole
East Tennessee State University

Disease registration is a cornerstone of public health practice. This abstract will draw comparisons between five scenarios involving disease registration: cancer, stroke, asthma, environmental contamination, and infectious disease. With these diseases, there are substantive distinctions posed with timing and format. These differences with the form for registration [e.g., sources, data times] may be self-evident, yet we will discuss them in a context of public health decision-making, of system design/operation, and the 'reporting' attribute of the CDC 'criteria for evaluating surveillance systems.' Among the most salient aspects of these diverse registration processes is the aspect of return registration, e.g., persons eligible for re-registration. This distinction is a component of the disease process, the current state of medical practice for the care of that disease as well as the case definition. Some of these inclusion rules have a great impact with timeliness of reporting, and may vary internationally. This talk will examine the distinctions with statistical analyses of these five registration forms, and their approach to 'early event detection' and field response. Considerations with legislated requirements for these settings will be contrasted, as well as the disposition toward state-level funding. Finally, the consideration of quality assurance will be examined. Two strategic comparison criteria will be contrasted in this quality assurance aspect: vital registration [birth, deaths] and the conduct of an epidemiological cohort study.

PS1.R Border Effects: Who's on First?

Tim E. Aldrich, Melissa Kennedy, Matt Groenewald, Varaprasad Ilapogu
East Tennessee State University

In 1990, North Carolina hosted a regional workshop in cross-border effects for environmental contamination. The need for neighboring states to 'know one another' and to communicate regularly was promoted. TN, KY, GA, NC, SC, FL, VA representatives attended. The recommendation for such cordial ties was potential cross-border environmental contamination. Some fifteen years later, this paper will posit the self-same need but for another scenario, that of avian flu. THIS IS A SIMULATION! We propose the devastating impact of this theoretical outbreak occurring at the junction of four states: KY, VA, NC, and TN. The location of these narrow state junctions is distant from each respective state capitol, heightening the delay with case reporting. We examine permutations of case dynamics, and reporting actions between states. We propose scenarios for case spread, infection transport, and resource dispersal. We discuss these reporting implications especially in the context of RHIO responsibilities and protocols. As a capstone, for the potential threat posed by a deliberate, rural disease outbreak [e.g., terrorism], we simulate the instance for a rural prodromal case located proximal to a large metropolitan area, e.g., Louisville, KY. The dynamics of disease reporting delay [between states] and the conflict of jurisdictions for actions in proximity to international highways will be discussed. The merits of efforts to promote neighboring state collegiality and communication we believe will be evident.

PS1.S Implementation of an Electronic Provider Reporting Form in New York City

Megan C. Saynisch, Hadi Makki, Letitia Williams
New York City Department of Health and Mental Hygiene

The New York City Department of Health and Mental Hygiene (NYCDOHMH) currently has 89 reportable diseases and conditions that health care providers are required to report. In 2002, the NYCDOHMH consolidated the majority of its paper disease provider reporting forms onto one paper form, the Universal Reporting Form (URF). Prior to this, various disease control programs (TB, STD, Communicable Disease) had separate forms which health care providers were required to complete and submit to separate locations, making the reporting process tedious and confusing. The paper URF allowed health care providers to submit their reportable disease results to a central location within the NYCDOHMH, and on one form. In 2003, the NYCDOHMH began development of an electronic, web-based version of the Universal Reporting form. The electronic URF (or eURF) allowed providers to submit reportable diseases via a health care provider portal on the NYCDOHMH Internet site. Once the reports were submitted online, the data was then parsed and distributed to the various disease control program areas.

After conducting focus groups with various health care providers on the acceptance of electronic, web-based reporting, the eURF was rolled out as a pilot in March 2004. Hospital-based infection control nurses were the group first targeted for implementation of the eURF. Pilot sites were chosen based on facility size and general interest in the new method of reporting. NYCDOHMH staff created extensive training materials and conducted on-site trainings in order to facilitate eURF implementation. The eURF was rolled out to the general health care community in July 2004.

Acceptance was initially slow, as many infection control practitioners did not have experience with internet-based applications. A noticeable improvement in acceptance occurred after skilled nurses began to conduct the trainings –infection control nurses and other health care providers were more comfortable receiving training from individuals with the same or similar health care provider backgrounds. Currently, 100% of hospital infection control departments (n=74) utilize the eURF to report disease cases and other conditions to the NYCDOHMH.

Electronic, web-based provider reporting vastly improves completeness (through the ability to label fields in the application as required) and timeliness of disease reporting. There is no cost to the facilities, provided they have adequate computer resources and internet access. Extensive training materials, on-site trainings, and a well-manned Help Desk were critical to the successful implementation of an electronic health care provider reporting form at New York City hospitals.

Trainers with an extensive knowledge of reportable diseases and skilled in web-based application training are key. Refining the application to make the online form easy to use is essential, as many of the providers initially trained had little or no experience with web-based applications. Additionally, it is important to create a web-based form that is flexible enough to allow for changes (e.g., addition of reportable conditions) and to have development staff dedicated to the maintenance of the application.

PS1.T CHESS for Private Providers: Deploying the NEDSS Base System in South Carolina Hospitals

Denise Doctor, MHA; Claire Youngblood, MA
South Carolina Department of Health & Environmental Control

Objective:
Summarize South Carolina's progress towards deploying Carolina's Health Electronic Surveillance System (CHESS) and South Carolina's implementation of the NEDSS Base System into hospitals within the state. Provide recommended steps for states planning to deploy the NEDSS Base System to external users.

Background:
CHESS has been live in South Carolina for over three years and has been in use at the regional level for more than two years. The next step in this critical project is the rollout of a limited version of the system for use by hospitals and other healthcare providers. Although this project is expected to result in faster and more accurate disease reporting over time, as well as better communication between providers and local health departments, there are a number of imposing challenges to overcome as the project goes forward.

Methods:
In the summer of 2006, SC DHEC began deploying CHESS into private hospitals, with a long-term goal of making the system available to all of the approximately 65 hospitals in the state, as well as to appropriate and interested smaller providers. Although there has been a great deal of enthusiasm for this project, a number of important questions must also be asked when such a project is undertaken. Among these are questions of marketing, security, training, user support and staff turnover. Some problems, such as what search capabilities, if any, may be provided, must be addressed carefully prior to any agreement with a private provider. To this end, DHEC employs two full-time CHESS trainers in addition to epidemiologists and IT staff that are involved in the project.

Conclusions:
While the deployment of the NEDSS Base System to outside providers is challenging, it is also very desirable in the long term. The success of such a project depends upon careful planning beforehand to ensure that new users have adequate training and support.

PS1.U Utility of Geographic Information Systems (GIS) Within State Public Health STD Programs

Jennifer M. Bissette, BS; Chris C. Delcher; Jeffrey A. Stover
Virginia Department of Public Health

Geographic Information Systems (GIS) are being used increasingly to enhance data analyses and enable better data visualization on multiple geographic scales. As such, increasing numbers of disease surveillance programs, including sexually transmitted disease (STD) programs, are using GIS to strengthen surveillance initiatives. Several STD project areas implemented GIS activities through OASIS, a CDC funded project aimed at enhancing surveillance activities. Through their collective experience of grappling with data confidentiality issues surrounding STD-related maps, these project areas created an informal GIS workgroup to discuss the unique security/confidentiality issues associated with mapped data.

The OASIS GIS workgroup decided to assess STD project areas' capacity to perform GIS functions as a means of garnering a better understanding of how such data is used and to learn how patient confidentiality is protected.

Virginia took the lead in developing a web-based survey on behalf of the OASIS GIS Workgroup. The survey was distributed by Email to all STD project areas, with the assistance of the National Coalition of STD Directors (NCSD). Follow-up telephone calls were made to non-responding project areas to encourage survey participation.

In total, fifty-three (82%) of the project areas (n=65) completed the survey. Over half of the project areas use GIS and geocode STD patient-level data, and have done so for over four years. Just over half of the project areas use the rule of five numerator rule for confidentiality of mapped data; however, the operational definition varied widely. There was variation in confidentiality rules applied by the remaining sites, and some sites stated that no rule was applied to the data. Eighty-five percent of all STD project areas that currently use GIS do not have written confidentiality guidelines to address GIS activities.

STD programs are employing various methods to protect mapped data. However, program variation and the lack of guidance documentation emphasize the growing need to develop procedural recommendations to assist disease surveillance programs make well-informed decisions.

GIS affords disease surveillance programs the ability to enhance surveillance through analy-

sis, visualization and reporting activities; however, programs need to remain cognizant of the potential risks of mapped data and how to best use this fast growing technology while maintaining patient confidentiality.

PS1.V When is EVENTDATE Not an "Event Date": Assessing the impact of reported date on quality assurance, outbreak/cluster detection and response and timeliness of disease reporting

Amy E. Belflower, MPH; Julie H. Schlegel, MSPH; Claire Youngblood, MA; Daniel Drociuk, MT, MSPH
South Carolina Department of Health and Environmental Control

Objective:
Carry out a quality assurance project on the completeness of date variables entered into the NEDSS-based system and the resulting composition of the EVENTDATE variable, to determine the impact accuracy of dates has on timeliness of disease reporting.

Background:
The South Carolina Department of Health and Environmental Control (SCDHEC) implemented the state's NEDSS-base system, the Carolinas Health Electronic Surveillance System (CHESS), in July of 2003. Quality assurance projects and reports on the timeliness of disease reporting have utilized the EVENTDATE variable in the CHESS system as the only complete and consistent date field present in all records. However, the EVENTDATE is obtained by finding the earliest date documented in the report. Dates present within each record may include: "date of report entry", "date of report to the local health department", "diagnosis date", and "illness onset date". Currently the NEDSS-based system does not indicate these dates as required fields when an individual record is generated. The EVENTDATE is populated from the following variable fields present in each record in the following hierarchal order: "Onset date", "diagnosis date", "report to the local health department" and "date of report entry". Only "date of report entry" into CHESS, which is an automatically generated date and present in all records, is used as the default EVENTDATE if no other date value is present in the record.

Methods:
"Date of report entry", "date of report to the local health department", "diagnosis date", "illness onset date", and EVENTDATE were queried from CHESS for all 289 cases involved in a large-scale Salmonella outbreak in May 2005. SC DHEC used this outbreak-related sample with complete paper-based documentation as well as electronic CHESS records, to determine: 1) completeness of date fields in CHESS reports, 2) percentages of date types that compose the EVENTDATE field, and 3) impact the accuracy of date used has on the disease reporting timeframe. Percentage of completeness of fields was calculated for each date type. These dates will also be obtained from paper-based reports and compared to electronic entry to determine completeness of actual available date data. Analysis of the date elements that compose the EVENT-

DATE was then conducted. Inferences were made as to the impact each date element has upon classification of disease reports into CHESS.

Results:
For this outbreak, “illness onset date” was documented for 83.4% of cases. However, “diagnosis date” was documented for only 17.3% of all cases. “Date of report to the local health department” was present in 57.8% of all records. When looking at date used for the EVENTDATE in CHESS, 83.4% were “onset date” and 4.5% were “diagnosis date”. “Date of report to the local health department” composed 5.9% of the event date, while 6.2% of event dates were composed of the default “date of report entry”.

Conclusions:
The low percentage of “diagnosis date” present in the CHESS record from this outbreak sample is a cause for concern. When responding to an outbreak or event of public health significance, oftentimes data may not be available. In the event of lack or incomplete documentation for illness onset date, the diagnosis date is often the best date for documenting the actual illness timeframe. Twelve percent of event dates for cases in this outbreak were composed of dates that could have been well after the illness time period. Not capturing the “illness onset date” or “diagnosis date” and having “date of report to the local health department” or “date of report entry” used as EVENTDATE may cause multiple problems for quality assurance analysis, outbreak/cluster detection and response, and timeliness of disease reporting.

PS1.W WONDER: Tools for Data Dissemination

Sigrid A. Economou
CDC

Ever wonder how you can share your own public health data collections on the web?

The WONDER system is a web-based application that integrates interactive online data queries, statistical analysis, tables, charts, maps and data extracts. The software is built with cost-effective public domain and open source Java libraries for the web server tier, XML and Structured Query Language (SQL) for the database tier, and standard HTML thin client for the end-user. The software is intended for open platform operations. The system is consistent with the PHIN architectural model, and provides a single software solution for many different online databases: vital statistics, cancer registry, TB and AIDS case reports, and soon the Vaccine Adverse Event Reporting System (VAERS).

What are WONDER's data analysis features for end-users?

Interactive online data queries, statistical analysis for summary counts, incidence and mortality rates, percentages, data distributions and more, tables, charts, maps, data extracts, dynamic cell suppression rules, and context sensitive technical notes or "caveats" for data interpretation when applicable. Numeric data reports are provided in context with additional information.

What do you need to create your own public health online database?

Data collections and a public health subject matter specialist, a data server with SQL query capability and a data manager, and access to a web server where the WONDER application and the Tomcat Java application server will run.

Who else participates in the WONDER community of collaboration?

Several CDC programs rely on WONDER for data dissemination to meet data release requirements. WONDER is also working with the Dataweb, the Community Health Assessment Initiative and the Environmental Public Health Tracking Network.

PS1.X NEDSS Link – A SAS AVR Tool

Robert F. Fagan
CDC

SAS is the primary AVR tool for integrated surveillance systems (NEDSS-compatible). This presentation will focus on the experience of adapting a CDC-based SAS/IntrNet AVR tool (National Notifiable Disease Surveillance System, NNDSS Link) to a state-based AVR tool (NEDSS Link). NEDSS Link began as a tool for analysis of foodbourne disease data (FSI Link). It was designed by Dr. Kate Glynn and Robert Fagan of the CDC Division of Public Health Surveillance and Informatics. The first users were members of the CDC foodbourne disease group. Based on their positive feedback the application was expanded to all nationally notifiable diseases and renamed NNDSS Link. The NNDSS Link AVR application received very positive feedback from CDC programs and the decision was made to modify the tool for state use. The tool was adapted to the reporting needs of a state health department NEDSS application and became NEDSS Link. The NEDSS team in AL agreed to pilot the tool and has evaluated NEDSS link over the past four months. NEDSS link includes maps, tables, and graphics available as either fixed reports, modifiable reports, or ad hoc reports. All reports can be viewed as formatted counts or adjusted for population. Table cells can be used to link to the line listed data for those cases represented in the report.

PS1.Y Integrating CDC Foodborne Disease Surveillance Systems

Kathryn S. Teates, MPH; Ric Williams, Chris Braden, Brenda Brown, Kelley Hise, Susan Van Duyne, Peter Gerner-Smidt, Terrell Miller, Jean Whichard, Tom Chiller, Jennifer M. Nelson
CDC

Background:
The Centers for Disease Control and Prevention (CDC) has several foodborne disease surveillance systems including the Foodborne Diseases Active Surveillance Network (FoodNet), national databases for case reports of Vibrio, Listeria, and Salmonella Typhi, the National Antimicrobial Resistance Monitoring System (NARMS), the electronic foodborne Outbreak Reporting System (ORS), and PulseNet, the National Molecular Subtyping Network for Foodborne Disease Surveillance.

Epidemiologic data are collected by individual case and outbreak forms. FoodNet was established in 1996 as the principal foodborne disease component of CDC's Emerging Infections Program (EIP). FoodNet conducts active, population-based surveillance in 10 sites (CA, CO, CT, GA, MD, MN, NM, NY, OR, and TN) by contacting over 650 clinical laboratories to ascertain all laboratory-confirmed bacterial infections of Shiga toxin-producing E. coli, Listeria, Salmonella, Shigella, Campylobacter, Yersinia, Vibrio, and parasitic infections of Cyclospora and Cryptosporidium. The case report forms for Vibrio, Listeria, and Salmonella Typhi are paper-based and contain demographic and exposure information submitted by state health departments. eFORS collects aggregate data on outbreaks reported by states including isolate identifiers. eFORS is a web-based outbreak reporting system established in 2001 to replace paper-based reporting.

Laboratory data are collected by NARMS and PulseNet. NARMS was established in 1996 to conduct antimicrobial susceptibility testing on Campylobacter, E. coli O157:H7, Listeria, Salmonella, Shigella, and non-cholerae Vibrio. Selected isolates are submitted to CDC by participating state public health laboratories and are susceptibility tested against several antimicrobial agents. PulseNet is a national network of public health laboratories that is used to identify clusters of foodborne disease by collecting pulsed-field gel electrophoresis (PFGE) patterns for Campylobacter, E. coli O157:H7, Listeria, Salmonella, Shigella, V. cholerae, and Y. pestis.

Each of these surveillance systems has an independent database which contains different pieces of surveillance information. The epidemiologic and laboratory data for one person may be contained in up to five separate databases for patient demographic, outcome, exposure information,

outbreak information, antimicrobial susceptibility results, and PFGE isolate pattern. To address research questions and increase the capacity and utility of foodborne disease surveillance data, CDC has initiated an effort to integrate data between these various systems. Additionally, an effort has been made to establish a standard set of values for commonly used fields, bringing more consistency to CDC's foodborne diseases surveillance.

Integrating Laboratory and Epidemiologic Data:
A common identifier, the state laboratory isolate identification number, is used to integrate data between these surveillance systems. Using integrated FoodNet and NARMS data, CDC has made several important public health observations. In a case-comparison study of persons with fluoroquinolone-resistant Campylobacter infections, it was determined that persons with fluoroquinolone-resistant Campylobacter infections had a longer duration of diarrhea when compared to persons with fluoroquinolone-susceptible infections. Additionally, integrating FoodNet and NARMS data demonstrated that persons with drug-resistant Salmonella infections had more severe infections when compared with persons with drug susceptible infections.

Future Integration:
Efforts CDC will continue to prospectively integrate laboratory and epidemiologic data. Maintaining a database with integrated FoodNet and NARMS data could elucidate additional relationships between severity of clinical illness and resistance phenotypes for foodborne diseases. Additionally, new PulseNet guidance for state public health laboratories includes recommendations to perform PFGE testing on all isolates submitted to NARMS. Integrating PulseNet and NARMS data will enable CDC to evaluate trends in diversity of PFGE patterns for a specific resistance phenotype like Salmonella Typhimurium that is resistant to ampicillin, chloramphenicol, streptomycin, sulfamethoxazole, and tetracycline (R-type ACSSuT) and describing the differences in diversity of PFGE patterns between outbreak and sporadic isolates. Further research on differences between sporadic and outbreak cases of foodborne disease would be possible by integrating outbreak data from eFORS with susceptibility results or PFGE results from NARMS and PulseNet, respectively. Future plans in the division include integrating outbreak reports in the ORS with NARMS isolates and PulseNet cluster identification numbers.

Challenges:
There are several challenges when integrating CDC's laboratory and epidemiologic foodborne disease surveillance data. First, data integration is limited prior to 2002, when the use of a standard state public health laboratory isolate identification number was implemented. Second, integrating data requires follow-up by both CDC and state personnel to ensure the use of the correct format of the state laboratory isolate identification number. Third, ORS is an outbreak-based system and not isolate-based, which poses a challenge when trying to link to isolate-based sys-

tems. Finally, integrating data on a larger scale using several databases has challenges that include incorporating PHIN standards.

Conclusions:
Integrating data from CDC's foodborne disease surveillance systems offers many opportunities but must include close collaboration between CDC, state epidemiologists, and laboratorians. The key to successful data integration is ensuring the correct and consistent use of the unique state laboratory isolate identification number. Linking CDC foodborne disease surveillance systems will increase the capacity for surveillance and research without creating and developing a new surveillance system and may prove to be a model for integrating CDC surveillance systems in the future.

PS1.Z Michigan Communicable Disease Reporting: Gathering Data through Electronic Laboratory Reporting

Brad Carlson, MPH; Gwen Thompson, Jim Collins
Michigan Department of Community Health

Electronic laboratory reporting (ELR) using HL7 messaging is a key component of the PHIN functions of 'Automated Data Exchange' and 'Specimen and Lab Result Information Management and Exchange'. As Michigan strives to achieve these functions, the Michigan Disease Surveillance System (MDSS) (Michigan's NEDSS Solution) has had success, and also faced challenges in implementation of ELR.

The Michigan Department of Community Health (MDCH) Bureau of Laboratories (BOL) has been successfully submitting electronic laboratory data in an HL7 format into the MDSS since December of 2004. During 2005, electronic laboratory reports initiated 7,143 case reports that account for 10.3% of all new reports in the MDSS during that time period. Implementation of ELR has also reduced the mean time from disease (non-STD) onset to referral cases from 14.7 to 8.7 days between November 2004 and April 2006.

The improvement of the timeliness of reporting and data completeness has not come without some challenges. The MDSS project team worked with the BOL laboratory information management system (LIMS) vendor to improve the format of the HL7 message being produced. Concurrently work was done with the MDSS software vendor to improve processing of a standard HL7 message to incorporate additional information beyond what was being sent in the initial BOL message. Modifying the MDSS to process all information in the incoming HL7 message was critical to the ability to bring on new laboratories.

With these improvements in place, MDCH has started outreach with other regional and national laboratories to bring new data sources into the MDSS electronically, via HL7 messaging. This has proven challenging, but we've made significant progress with one national laboratory. As many other states are finding, HL7 messages can vary significantly in format, content and coding. Michigan's current strategy is to work with the laboratories to make modifications to adhere to the accepted HL7 standards. In addition, Michigan is planning to perform some preprocessing and mapping of local codes to SNOMED codes outside of the MDSS system using the Orion Rhapsody software in coordination with products developed as part of the PHIN initiative. We believe this strategy will pave the way for future laboratory integration in a consistent and timely fashion. Michigan will present the successes, challenges and future strategy regarding electronic laboratory reporting into the MDSS.

PS1.AA Getting the Big Picture: Analyzing, Visualizing and Reporting Public Health Incidences in a PHIN-Compliant System

Marlene J. Bednarczyk, MSQSM
New Jersey Department of Health and Senior Services

Whether they are parsed from an electronic feed from a commercial lab or they are entered manually, on a web-enabled system, which is accessed on-site at a hospital, medical center, local or county health department, incidences of infectious diseases are documented, geo-coded and instantly ready for analysis, visualization and reporting in New Jersey's Communicable Disease Reporting and Surveillance System (CDRSS). This abstract details these functionalities.

Detailed case information from investigative public health work can be entered in the CDRSS. Specific data entry screens provide for the documentation of patient information, multiple address types (work, vacation, etc.), clinical status, signs and symptoms and risk factors, laboratory evaluations, case comments, epidemiology and case classification. Once classified, case information is transmitted to the CDC as part of the CDC MMWR weekly transmissions. During the identification and investigation stages, data are accessible to authorized public health partners. Investigators on the cases are identified, complete with affiliations and contact information, which facilitates follow-up. Users who create or update cases are equally accessible via direct e-mail links or by telephone.

As investigative work unfolds, the need to incorporate newly identified parameters pertinent to the specific incidence of disease often arises. The dynamic CDRSS provides the administrative capability to add new signs, symptoms and risk factors as soon as they are identified, thus making the collection of significant data more comprehensive and thorough. The data fields in the CDRSS, old and new alike, are all exportable for further analysis.

As required by PHIN Preparedness, the CDRSS supports analytical searches based upon multiple criteria. Reports in the CDRSS can be produced as maps, charts and graphs, as well as in detailed and aggregated report formats. Reports can be generated as line lists, detailed cases, comparisons with multiple previous years, aggregated data, and grouped by disease or geographical location. They can be exported from Crystal Reports into word document files, spreadsheets, comma separated value files, and then further analyzed using programs such as EPI-INFO or SAS. Investigators and users can generate individual reports listing cases they are working on for easy follow-up and briefing. In addition, blank case reports can be printed for use in the field or on the phone to collect data. The blank case reports contain all the requisite data fields as required for a specific disease. If new parameters have been assigned to the disease

for a specific investigation, they can also be part of the updated blank case report, allowing investigators to collect uniform data, as well as helping to guide and focus the investigation.

Specific reports can request in detail the number of cases, the number of contacts per case, the number of cases with no known epi-link at the time of diagnosis, the lab results, and the number of vaccinations and or treatments administered. Preformatted queries provide for faster, more routine and uniform data.

Via the enhanced geo-coding capabilities of the CDRSS, data can be mapped according to incidences of diseases and their geographical locations (expressed as specifically as street addresses or as generally as zip code centroids). Specific addresses not covered in the commercial geo-coding software can be manually assigned to a specific spot on the map, generating XY coordinates in the process to record that location for future reference.

These maps, in addition to the visual presentation of the data, have the ability to provide point and click background information on each case and pertinent data on its geographical location, including local health department jurisdiction, local health officer contact information, any municipal, county and state demographics required, as well as designating populated and unpopulated areas.
In addition to mapping information, many reports have the ability to be portrayed as a graph, thereby permitting the visual representation of data to indicate correlations between data sets, movement over time, distributions and etcetera. Of course, any data can be exported and displayed in MS Power Point slides and graphs, expanding the display repertoire further.

Comprehensive comment recording capabilities, complete with a detailed audit trail, provide an extensive log of all work done during the investigation of a case. Comments are date and time stamped, assigned a comment number and the contact information for the comment initiator is provided as a live link at the comment record site.

Contact tracing functions identify multiple tiers of incidences of communicable diseases, which can be mapped and displayed instantly in the CDRSS, providing a visual representation of the spread or path a disease takes.

All of the case information generated is protected behind extensive security systems and users have been trained to protect and respect the privacy of the patient and have signed confidentiality agreements to that effect. Users who no longer work in their public health functions have their access privileges removed.

Due to the adherence to PHIN Preparedness functionalities and Key Performance Measures, any data generated in any report is available for analysis using any analytical tools identified by PHIN – such as: SAS, SPSS, EPI-Info, MS Access, MS Excel, and of course Crystal Reports which is the software used to generate report data in the CDRSS. Over 70 report configurations are detailed in the CDRSS, while an infinite number of permutations of those reports can be generated to address specific user needs. All reports, in addition to a title and date range, list the parameters defined when requested. Access to detailed or aggregate data are limited by viewing privileges granted in the system. Due to the uniformity of the data generation format, sharing information with PHIN-compliant public health professionals nationwide and accessing analysis tools to apply to data generated by CDRSS expands the repertoire for data analysis in New Jersey. We are able to extensively document, recall, report, analyze and present visual representations of our communicable disease information.

PS1.BB Building Requirements: Ensuring Success for Your Public Health Application

Jeffrey Ditty, BS
Public Health Foundation Enterprise

Information systems (IS) projects typically have a high cost and low success rate, giving the client organization a high degree of risk in software application building. Every stage of any IS project refers back to the project's initial business requirements. Since the business requirements driving it are the core of any IS project, success rests on the development of effective requirements.

In public health, there are many complex workflows and processes that must be addressed in order to implement an IS system that adequately supports the required business functions. These processes are often dynamic and must be able to change with the current industry focus or the latest emergent public health issue. In order to satisfy these complex and changeable workflows and processes in an IS application, any and all requirements must be developed and communicated effectively.

By effectively developing requirements for PHIN applications, the first successful steps towards PHIN compliance and a unified methodology for software development can be achieved. A unified process, such as the Public Health Unified Process (PHUP), incorporates business requirements as the core component towards successfully implementing and managing a software development process. There are two main activities involved in developing requirements for a project or application: gathering and analyzing.

Gathering requirements - the initial stage - is facilitated by communicating with project stakeholders and end-users to ensure that their business needs are satisfied. Listed below are several tools and processes that can be used to effectively gather requirements for a project.

1) Joint Application Development: (JAD) sessions A JAD session is a software engineering technique used to gather and document detailed requirements for an application or project. A JAD session promotes brainstorming, out-of-the-box thinking, and creative insight for developing the functions that the application will perform. The most common tool used for gathering requirements for a software application, JAD sessions can be small or large, but the focus is on defining the requirements of the system.

2) Interviews / Surveys: This technique is as simple as the title. Conducting interviews or surveys is a valuable way to gather information for insight on building requirements.

Although this method is static, it can be beneficial when dealing with a large group of stakeholders and users – especially when time is critical.

3) Focus Groups: In essence this technique involves several JAD sessions occurring at the same time. This method breaks down the business requirements into several groups that can focus on particular workflows or processes. Utilizing this method will require organization from the project manager. But it allows multiple groups to focus on different aspects of the business requirements, providing a greater level of detail to the software developer.

Once the requirements for a project or application have been gathered and documented, the next stage of requirements development is to analyze the information. Analysis provides a technical perspective and is the first stage of implementing the business requirements into an application architecture perspective. Listed below are several common tools and methods that can be used for requirements analysis.

1) Use Cases: Use cases are a common and practical method of capturing functional requirements of an application or system. Use cases are documents produced to show the scope of the function, actors (or users) involved, triggers affecting the function, and the actual steps involved in the function.

2) Software Requirement Specification (SRS): A Software Requirement Specification, or SRS, is an organization's written understanding of system requirements and dependencies prior to any actual design or development work. It is a binding document that assures that both the organization and the development team understand the business requirements to be supported by the application during the project's technical design and construction phases. This document is typically considered a parent document to which all other project documents (communication, quality assurance, and project plans) for validating requirements. This document will contain all use cases or system specifications produced and any modeling or additional technical information that is relevant to the software release or build.

3) Object Modeling: Object modeling uses a standardized set of symbols and ways of arranging them to model an object-oriented software or system design. Object modeling is a visual process that diagrams the text-based requirements into a workflow that is not only beneficial for analysts, architects, or programmers, but can also provide valuable insights for project managers and stakeholders. An example of object modeling is using the Unified Modeling Language (UML), a general-purpose modeling language that uses

standard graphical notation to describe an abstract model of a system.

4) Storyboarding: Storyboarding is the process of showing everything that will be contained in a function or process. Storyboards are graphic images created to show the end result of the Graphical User Interface (GUI) for a particular process, workflow, or system. The storyboards contain everything from graphic logos to menu items to and links within the system. It is a realistic and explicit method of communicating the end result of the requirements from the user's perspective. Storyboards can be static images or interactive sequences.

5) Prototyping: Prototyping is an advanced method for communicating the design aspects of business requirements. Building prototypes actually creates functioning system files that the end user or developer can use interactively to validate requirements or processes. Prototypes are not meant to show what the system will look or feel like, but to provide an interactive platform for demonstrating functions or workflows. Prototyping can be effective in clarifying any misunderstandings between developers and users; finding missing services or functions; or demonstrating complex workflows or procedures.

Not all of the above methods and tools are necessary for an IS project or application. These are just tools that are available for use on any project or application.

In summary, effective business requirements are critical for the success of any IS project. In order to support the success and compliance of a public health or PHIN application, different methods and tools can be utilized to properly develop business requirements.

PS1.CC Assessment of Potential Use of UMLS in HuGE Literature Indexing

Ajay J. Yesupriya
CDC Office of Genomics and Disease Prevention

Introduction:
Human genome epidemiology (HuGE) is an emerging scientific field that spans a wide spectrum, from gene discovery to population-based studies of genotype prevalence, gene-disease associations and gene-environment interactions. Its goal is to systematically apply epidemiologic methods and approaches to population-based studies exploring the impact of human genetic variation on health and disease (1). The CDC Office of Genomics and Disease Prevention maintains a published literature-based information system, known as HuGE Pub Lit, (2) to facilitate the collection and dissemination of HuGE published literature from MEDLINE. The current system is based on utilizing the ICD9 vocabulary for coding diseases/outcomes and an ad hoc method to categorize exposures and non-ICD9 coded diseases/outcomes. Thus, the database suffers from user subjectivity, contains many spelling errors, and has a tendency for duplication. The Metathesaurus, one of three major components of the Unified Medical Language System (UMLS), is considered the largest thesaurus in the biomedical field (3). It consists of over 100 controlled vocabularies, organized by unified biomedical concepts with corresponding concept unique identifiers (CUI). To explore the possibility of using UMLS as a controlled vocabulary in this system, we performed a mapping study to evaluate the performance of UMLS for HuGE concepts.

Methods:
We experimented on three sets of terms extracted from different sources that represent the most common concepts in the HuGE literature:

1) 5% of terms from the GDPInfo database, containing 631 exposures and 2,068 disease/outcome coding terms (804 ICD-9 terms and 1,264 non-ICD9 terms);

2) a list of the most frequent key words extracted from HuGE MEDLINE abstracts using a statistical method (4);

3) a list of query terms compiled by a librarian for querying HuGE literature in PubMed and EMBASE. MMTx, a program implementing MetaMap (5) to map free text to UMLS concepts, was used to conduct the automatic mapping.

Terms that failed mapping by MMTx were mapped manually using the UMLS knowledge

source server web site. All terms mapped by MMTx were evaluated by a domain expert to ensure mapping accuracy.

ResultsHuGE Pub Lit Terms Mapping:
Overall, 78% of HuGE concepts (including diseases/outcomes and exposures) were mapped to UMLS concepts directly. Not surprisingly, we found that 4% of terms in the current system had spelling errors. 18% of terms required additional information from the original Pubmed abstracts to help elucidate the concepts and determine CUI codes. In reference to exposures, CUIs could be found for about 80% of terms with an additional 6% after spelling errors were corrected. CUI codes for all remaining terms were acquired by returning to the original Pubmed abstracts for further information about these problematic concepts. Diseases with assigned ICD9 codes required the lowest amount of modification to yield associated CUI codes. 90% of these terms transferred directly while the CUIs for the last 10% were found by using supplementary information. For disease terms without associated ICD9 codes, we found that UMLS codes could be located for 2/3 of the terms directly. After correcting spelling errors and examining Pubmed abstracts for additional information on the concepts in question, 99% of terms could be mapped to appropriate UMLS codes. An appropriate code could not be identified for only one term in the sample.

HuGE Literature Significant Key Words:
784 key words were mapped to UMLS codes; 93% could be mapped directly. After a domain expert removed some unknown abbreviations and key words unrelated to HuGE, about 97% of terms were mapped correctly to corresponding UMLS codes. Two sets of HuGE terms for querying PubMed and EMBASE databases, 144 terms for querying HuGE literature in PubMed and 188 in EMBASE were used to perform UMLS mapping. 99% of terms for PubMed were mapped to UMLS terms, as were 100% of terms for EMBASE.

Conclusion and Discussion:
The adoption of standard vocabulary has become a critical component of implementing the PHIN compliance information system at CDC. Due to the multidisciplinary nature of HuGE, a single controlled vocabulary (e.g., ICD9) is not able to accommodate the indexing of diverse concepts inherent to the field. Although Medical Subject Heading (MeSH) is well known for biomedical literature indexing, it is still not comprehensive enough to cover all possible indexing terms, especially those related to genetic information such as gene symbol, alias, etc. UMLS was designed to consolidate many controlled vocabularies (>100) to a single repository without a loss in granularity. The mapping results of this project showed that over 90% of disease and exposure terms in the HuGE literature can be mapped to corresponding UMLS concepts. In addition, since the most frequent key words in HuGE literature and

terms used to query PubMed and EMBASE were mapped at a very high rate (98% and 100%), UMLS may be suitable for human genome epidemiology concepts and could be used in the development of a HuGE ontology.

References:

1. Muin J. Khoury, Julian Little, and Wylie Burke. Human genome epidemiology: a scientific foundation for using genetic information to improve health and prevent disease. New York: Oxford University Press, 2004.

2. Lin BK, Clyne M, Walsh M, Gomez O, Yu W, Gwinn M, Khoury MJ. Tracking the epidemiology of human genes in the literature: the HuGE published literature database. Am J Epidemiol. 2006 Apr 26.

3. Humphreys BL and Lindberg DA. The UMLS project: making the conceptual connection between users and the information they need. Bull Med Libr Assoc. 1993 April; 81(2): 170–177.

4. Polavarapu N, Navathe SB, Ramnarayanan R, Haque AU, Sahay S, Liu Y. Investigation into biomedical literature classification using support vector machines Proc IEEE Comput Syst Bioinform Conf. 2005;:366-74.

5. Aronson AR. Effective mapping of biomedical text to the UMLS Metathesaurus: the MetaMap program. Proc AMIA Symp. 2001;17-21.

PS1.DD Implementing a UMLS-Enabled Knowledgebase in Human Genome Epidemiology

Wei Yu, PhD, MS;
CDC Office of Genomics and Disease Prevention

Background:
Having access to potentially unlimited knowledge sources challenges researchers who need to find relevant information efficiently. Many domain-specific databases ([1]) have been created to meet this need.

Human genome epidemiology (HuGE) is a rapidly emerging field that seeks to evaluate the impact of human genetic variation and gene-environment interactions on health and disease in populations. Increasing numbers of published research findings are deposited in public domains such as PubMed each year. In 2000 the CDC Office of Genomics and Disease Prevention (OGDP) began an initiative to identify published literature in PubMed that is relevant to HuGE (2).

To facilitate HuGE research we have developed a knowledgebase system called HuGE Navigator consisting of several different applications that use the Unified Medical Language System (UMLS) (3) to maximize data interoperability and integration. In this presentation we briefly discuss our applications, system architecture and document indexing strategy; we also describe the benefits of using UMLS and discuss some design and implementation issues.

Components of the System:
GeneSelectAssist: designed to help identify candidate genes for genetic epidemiology association studies. The search query can include disease/outcome, environmental risk factors, etc. The application selects and prioritizes genes based on abstracts in PubMed, epidemiological association studies in the HuGE Navigator database and evidence from animal models in NCBI Entrez Gene.

HuGE Literature Finder: designed for finding published literature on human genome epidemiology. The search query can include disease/outcome, environmental factors, genes, author's name, affiliation, etc. The results can be further stratified by these and other characteristics. The list of selected articles can be redirected to the PubMed website to take advantage of functionality it provides such as uploading to reference software.
CDC Genotype Prevalence Database: designed for presenting genotype prevalence informa-

tion extracted from selected HuGE systematic reviews and the CDC NHANES genotyping project. This application also allows the user to perform an on-line meta-analysis for any selected genotype.

HuGE Investigator Browser: designed for finding investigators or collaborators in human genome epidemiology based on study interests such disease/condition, environmental risk factors, or gene. Investigator information is extracted using an accessory utility that automatically parses the affiliation data provided by PubMed.

HuGE Reality Checker: designed to help evaluate the predictive ability of genetic markers by calculating a variety of indicators relevant to epidemiology and public health, such as clinical sensitivity, specificity, predictive value positive, etc.

System Architecture:
The HuGE Navigator was built on three discrete modules that are loosely coupled. The data module contains all data in the database; the accessory utility module is responsible for a series of data transactions and manipulations and the application module includes all applications in the system. To avoid versioning issues, we allow data entities from external data sources (e.g. UMLS Metathesaurus, Entrez Gene and MeSH tree) to be updated as needed without an overhaul of the entire system. Each application was built on top of this model, allowing for seamless navigation and easy plug-in of new applications.

Literature Document Indexing Strategy:
Document indexing is crucial for successful information retrieval. The accessory utility module downloads PubMed abstracts and their corresponding Medical Subject Heading (MeSH) terms and uploads them to the HuGE Navigator database automatically. The accessory utility module then maps the MeSH terms to UMLS concepts and indexes the document with the corresponding UMLS codes. The MeSH tree, a standardized hierarchical relationship between MeSH terms, has also been incorporated into the system to increase the sensitivity of information retrieval by including “children” terms. Gene information (symbol, name, aliases) from the NCBI Entrez Gene database is integrated into the UMLS concept list to enhance the capacity of the UMLS Metathesaurus.

Benefits of UMLS implementation:
Because UMLS contains over 100 vocabularies from biomedical fields, many synonyms and variants of terms are collected in the Metathesaurus which combined with UMLS indexing, allows for robust free text searching. Incorporating synonyms into user queries increases the sensitivity of searching external databases (e.g. NCBI Gene Database, PubMed). Data inter-

operability is a big benefit of UMLS implementation.

Improvement of Performance by Dynamic Data Dub-setting:
The 6 million unique concept names in UMLS could create performance issues if the table for the codes had to be queried directly. Even after removing non-English and retired concepts, the table still contains 3 million records. The multidisciplinary nature of human genome epidemiology precludes further sub-setting by domain-specific criteria. To resolve this issue, we created an automatic UMLS concept sub-setting process, populating the subset table dynamically whenever new MeSH terms were identified in the literatures deposited in the database. The size of the UMLS subset data (23,000) was reduced dramatically, significantly improving performance.

User-friendly user interface:
The HuGE Navigator interface was designed with a similar look and feel for each application facilitating easy navigation among applications and maximum information retrieval. The interface is designed to be simple and intuitive so that the user knows how to perform each search without reading instructions.

Future directions:
The HuGE Navigator is an important new tool supporting the global HuGE community's goal of research synthesis. UMLS is a good choice for indexing HuGE literature (see poster by Yesupriya, et al). Equipped with other UMLS sources such as Semantic Network and SPECIALIST Lexicon, we should be able to explore the published literature much more effectively and to infer more in-depth knowledge of human genome epidemiology.

References:

1. Galperin MY. The molecular biology database collection: 2006 update. Nucleic Acid Res. 2006 Jan 1;34(Database issue):D3-5.

2. Lin BK, Clyne M, Walsh M, Gomez O, Yu W, Gwinn M, Khoury MJ. Tracking the epidemiology of human genes in the literature: the HuGE Published Literature Database. Am J Epidemiol. 2006 Apr 26.

3. Humphreys BL and Lindberg DA. The UMLS project: making the conceptual connection between users and the information they need. Bull Med Libr Assoc. 1993 April; 81(2): 170–177.

PS1.EE An Epidemiological Framework for a Hypothesis Generating Investigation of Multiple Near-Concurrent Vaccinations and Potential Health Endpoints

Daniel C. Payne, PhD[1]; Jodi Blomberg, MS[2]; Michael M. McNeil, MD, MPH[3]; Aaron Aranas, MD, MBA[3]; Charles E. Rose, Jr., PhD[3]
[1]*CDC Vaccine Analytic Unit,* [2]*SAS Institute, Inc.,* [3]*CDC National Immunization Program*

Limited scientific evidence exists regarding whether health effects are associated with receiving multiple near–concurrent (MNC) vaccinations among adults. The medical literature available on this topic addresses primarily isolated observations following specific childhood vaccine combinations and relatively small cohorts of adults. To our knowledge, no defined framework for evaluating this topic in a comprehensive and standardized fashion using a large health outcomes dataset has been reported. A prototype framework using SAS Enterprise Miner applications to study this topic will be presented.

Staff from the Centers for Disease Control and Prevention (CDC) and SAS, Inc. applied SAS Enterprise Miner software to data collected by the Defense Medical Surveillance System (DMSS), a longitudinal surveillance database administered by the U.S. Army Medical Surveillance Activity. We used SAS Enterprise Miner to conduct a range of analyses, including decision trees and sequence analysis to define and describe this hypothesis generating framework using the full DMSS dataset of medical, vaccination, administrative, demographic, and deployment information for over 7 million adults. Our approach enabled us to view the topic of MNC vaccinations and health endpoints from 4 relevant perspectives of exposure: differing combinations of nominal vaccine types, live versus non-live vaccines, vaccines containing aluminum adjuvant versus those without this adjuvant and lastly, by a continuous variable representing cumulative antigen counts.

PS1.FF Quality Analysis of Syndromic Surveillance Data

Stephen H. Wagner[1], **Bryant T. Karras, MD**[2]
[1]*University of Washington Center for Public Health Informatics,* [2]*University of Washington School of Medicine*

A dataset of emergency room triage encounters with associated free text chief complaints syndromic surveillance categories assigned by the CoCo software program and ICD-9 codes was analyzed. The free text chief complaints were manually inspected and assigned categories. The CoCo-assigned categories were then compared to the manually selected categories and to the encounters' ICD-9 codes.

The manual inspection and assignment of categories indicated that the software category assignment did a reasonable job of assigning categories based upon the category definitions provided with the software. One current limitation of the software is that it can assign only one category per encounter—the manual assignment assigned multiple categories if appropriate. The manual inspection found that 12.5% of encounters were either miscategorized or applicable to additional categories.

CoCo categorized 2,051 encounters as true positives (encounters falling into syndromic categories of interest) while ICD-9 codes indicated that an additional 1,074 encounters were true positives (CoCo had identified them as negatives).In addition, comparison of CoCo-assigned categories to actual ICD-9 codes yielded quite different encounter counts depending upon category. Both CoCo and manual assignment greatly understated encounter counts in the categories of Hemorrhagic and Botulinic relative to ICD-9 coding. On the other hand, CoCo and manual assignments overstated encounter counts in the categories of Gastrointestinal, Neurological, and Constitutional relative to ICD-9 coding.

Recommendations for improving the quality of the category predictions include local "training" of the CoCo probabilities file, modifications to CoCo, standardization of the category definitions, and modification of the terms of the data sharing agreement.

PS1.GG Healthcare Code Sets, Clinical Terminologies and Classification Systems: Partnerships for Quality Public Health Information

Kathy Giannangelo, RHI, CCS
American Health Information Management Association (AHIMA), Chicago, Illinois

The need for better ways and means to understand, organize and analyze health data is increasing as the automation of health information continues. To meet this need and to exchange comparable sets of clinical and administrative data, standards must be adopted and implemented.

Data standards that are essential to interoperability among healthcare entities include healthcare code sets, clinical terminologies and classification systems. These systems are key to having the encoded data that users need to access, combine, manipulate and share for various purposes.

For example, classification systems provide essential data that are used in monitoring public health and risks. Since the practicality of healthcare code sets, clinical terminologies and classification systems usage within healthcare is tied to the applications that employ these systems, more than one is necessary. There is not one system that meets all the needs of healthcare providers, organizations and plans. SNOMED, CT, LOINC and ICD are just a few of that are considered necessary.

There is also a difference between coding for direct patient care and classification for statistical purposes. Depending on the "use case," certain terminology systems are appropriate for chosen applications. For example, by definition classification systems group together similar diseases and procedures and organize related entities for easy retrieval for public health data analysis. However, they are inadequate for primary documentation of clinical care. In the same vein, because of their size, significant granularity, intricate hierarchies, and lack of reporting rules, many clinical terminologies are insufficient for serving the purposes for which classification systems are used.

Although multiple healthcare code sets, clinical terminologies, and classification systems are clearly needed, they do present various implementation opportunities and challenges. Consider the capture of clinical data at the point of care for efficient and effective administrative application through mapping. Automated maps are efficient because they minimize duplicative data entry. In essence, they offer the "code once, use many times" functionality. Furthermore, mapping from a terminology to a code set or classification enables its use for

multiple purposes including public health reporting.

After attending this session, attendees will be able to:

1. State the differences between healthcare code sets, clinical terminologies and classification systems and describe how each could be used in public health

2. Explain how healthcare codes sets, clinical terminologies and classification systems working together will produce better data to meet the needs of users of public health information

3. Provide an example of how mapping from a terminology to a code set or classification maximizes the value of clinical data contained in electronic health record systems and enables its use for public health reporting.

How does the activity/project described meet or plan to meet PHIN compliance?

The healthcare data from hospitals, laboratories and other public health partners are encoded using standard clinical terminologies, classification systems and administrative code sets. To be compliant with PHIN standards requires the healthcare codes sets, clinical terminologies and classification systems to work in partnership with each other. Collectively they will produce better quality data to assess the nation's public health and to improve public health practices as well as medical readiness.

Are there specific industry standards or capabilities pertaining to your topic area that contribute to PHIN's advancement?

The Healthcare Information Technology Standards Panel (HITSP) has established basic standards readiness criteria. These criteria include suitability for purpose and compatibility, sponsoring standards developers' organization and process, costs and ease of access, life cycle maturity and other considerations, such as jurisdictional laws and regulations. The current healthcare codes sets, clinical terminologies and classification systems usage within healthcare is tied to the applications that employ them. Any expansion of PHIN vocabulary domains to support additional public health areas of interest means increased alliances among partners and stakeholders in order to better utilize the appropriate standards.

Ancillary Meetings

In addition to the scheduled PHIN Program, many groups are utilizing this opportunity to meet for various objectives. Below is a listing of the ancillary meetings scheduled around the 2006 PHIN Conference.

Sunday, September 24

NAPHIT The National Association for Public Health Information Technology (NAPHIT) will hold a meeting of its membership **Sunday, September 24, 2006 from 8 a.m. -5 p.m. ET in Hanover rooms C, D, and E** of the Hyatt Regency Atlanta.

NACCHO The National Association of County and City Health Officials (NACCHO) will hold a meeting of its membership **Sunday, September 24, 2006 from 4 p.m.– 7 p.m. ET in Hanover room G** of the Hyatt Regency Atlanta.

APHL The Association of Public Health Laboratories (APHL) will hold a meeting of its membership **Sunday, September 24 from 12 p.m. – 6 p.m. ET in Hanover room F** of the Hyatt Regency Atlanta.

PHIN Certification The Public Health Information Network (PHIN) Certification team will meet **Sunday, September 24 from 1 p.m.– 5 p.m. ET in the Learning Center** of the Hyatt Regency Atlanta to discuss and provide assistance on the PHIN Certification process. Please RSVP by sending the name of your organization, the names of those attending and the functional area you would like to discuss to PHIN@cdc.gov.

OMS 1.2 Seminar and Exchange The Outbreak Management System (OMS) Deployment and Development teams will provide an open house for the OMS Users Working Group on **Sunday, September 24, 2006 from Noon to 4 p.m. ET in Hanover room A** of the Hyatt Regency Atlanta. This informal, free-form session, will allow attendees to try out OMS v. 1.2 for themselves on workstations provided while members from both the deployment and development teams will be on hand to answer questions and provide assistance with demonstrations.

Tuesday, September 26

PHINMS User's Group Meeting Share experiences and learn from some of the largest users of PHINMS relate how they use the product and learn from their experiences. The CDC development staff will be on hand to answer questions and directly receive your requests for product

enhancements. This meeting is targeted at users of PHINMS. It will be held on **Tuesday September 26, 2006 from 7:00 a.m.-8:30 am in room Dunwoody** of the Hyatt Regency Atlanta.

Countermeasure and Response Administration Partner Workshop will be held **Tuesday September 26, 2006 from 7:00 a.m.-8:30 am in room Hanover A/B** of the Hyatt Regency Atlanta. Version 1.4 of the Countermeasure Response Administration Application will be ready for release in Fall 2006. This workshop will feature a preview of V1.4 along with an interactive discussion with interested partners to solicit input and suggestions for further enhancements.

PHIN Open Conversation - A Facilitated Dialogue for the Future NCPHI has asked independent facilitators to lead a discussion that looks to the next three to five years, and welcomes your perspective and constructive guidance in shaping the future of PHIN during a facilitated session of open conversation. This discussion will be held **Tuesday, September 26 from 6 p.m.– 9 p.m. in the Centennial Ballroom** of the Hyatt Regency Atlanta. During the PHIN Open Conversation session, facilitators will manage concurrent groups discussing specific topics. The topics and potential questions for each area that we will explore include: PHIN Communication, PHIN and Preparedness, PHIN Certification, PHIN Requirements, PHIN Collaborative Development and PHIN Technical Assistance. For more information on this session, go to www.cdc.gov/phin..

Electronic Laboratory Reporting There will be a "Birds of a Feather" seminar on Electronic Lab Reporting. This seminar will be held **Tuesday, September 26, 2006 from 7 p.m. – 10 p.m. in Hanover rooms A and B** of the Hyatt Regency Atlanta.

Environmental Public Health Tracking Standards and Network Development Work Group This is an open session which will be held **Tuesday September 26, 2006 from 5:00 p.m.-6:30 p.m. in Fairlie room** of the Hyatt Regency Atlanta. The Environmental Public Health Tracking (EPHT) Program's Standards and Network Development (SND) Workgroup will meet to discuss the progress of current activities. The mission of the SND Workgroup is to facilitate and promote collaboration among CDC and other partners in development of the EPHT Network as it relates to network functions, requirements, and data and information technology specifications and standards.

Wednesday, September 27

PHIN Requirements Reorganization Review This is an open session which will be held on **Wednesday September 27, 2006 from 7:00 a.m.-8:30 a.m. in room Dunwoody** of the Hyatt Regency Atlanta. CDC will introduce the proposed reorganization of existing PHIN require-

ments. The proposed reorganization is based on recommendations by partners given through workshops and working groups. Participants are asked to review the reorganization and validate whether it is a better framework for showing how PHIN supports public health activities at the State and local level.

HAN The Health Alert Network (HAN) coordinators will have a social event the evening of **Wednesday, September 27, 2006**. Details of this event will be posted at a later date. Anyone interested in attending please meet in the lobby of the hotel at 7:00 pm.

CSTE The Council of State and Territorial Epidemiologists will meet **Wednesday, September 27 from 11 a.m. – 1:30 a.m. in Executive Conference Room 219** of the Hyatt Regency Atlanta.

PHIN Requirements Work Group II The PHIN Requirements group will meet **Wednesday, September 27 from 5 p.m. – 7:00 p.m. in Executive Conference Room 219** of the Hyatt Regency Atlanta. This is CDC formed work group consisting of state and local representatives tasked with recommending a format for presenting the existing and future PHIN requirements. This workgroup will be discussing how to improve the layout of the PHIN requirements to assist State and local public health agencies in implementing them. Discussions will cover if the current format is easy to understand, efficient to use, and structured so that the requirements can be used in assessing system gaps and needs.

Thursday, September 28

NEDSS The National Electronic Disease Surveillance System (NEDSS) team will present "NEDSS Project Discussions on ELC Funding, Electronic Case Reporting (NND) to CDC, and NEDSS-related CDC Software Product Availability (NEDSS Base System, NEDSS PAM Platform, NEDSS Message Subscription Service, Rhapsody, GeoStan, ChoiceMaker, and SAS): A training session for the NEDSS Message Subscription Service and Rhapsody." The session will be conducted **Thursday, September 28 from 8 AM to 12:30PM in room Dunwoody** of the Hyatt Regency Atlanta.

HAN The Health Alert Network (HAN) coordinators will meet **Thursday, September 28, 2006 from 9:00 AM – 1:00 PM in Spring room 70** of the Hyatt Regency Atlanta.
Items to be discussed include:

- Election of "Officers"
- Epi-X Update
- National Public Health Radio Network

- ESAR VHP Update
- PHIN PCA
- State Presentations of “Best Practices”

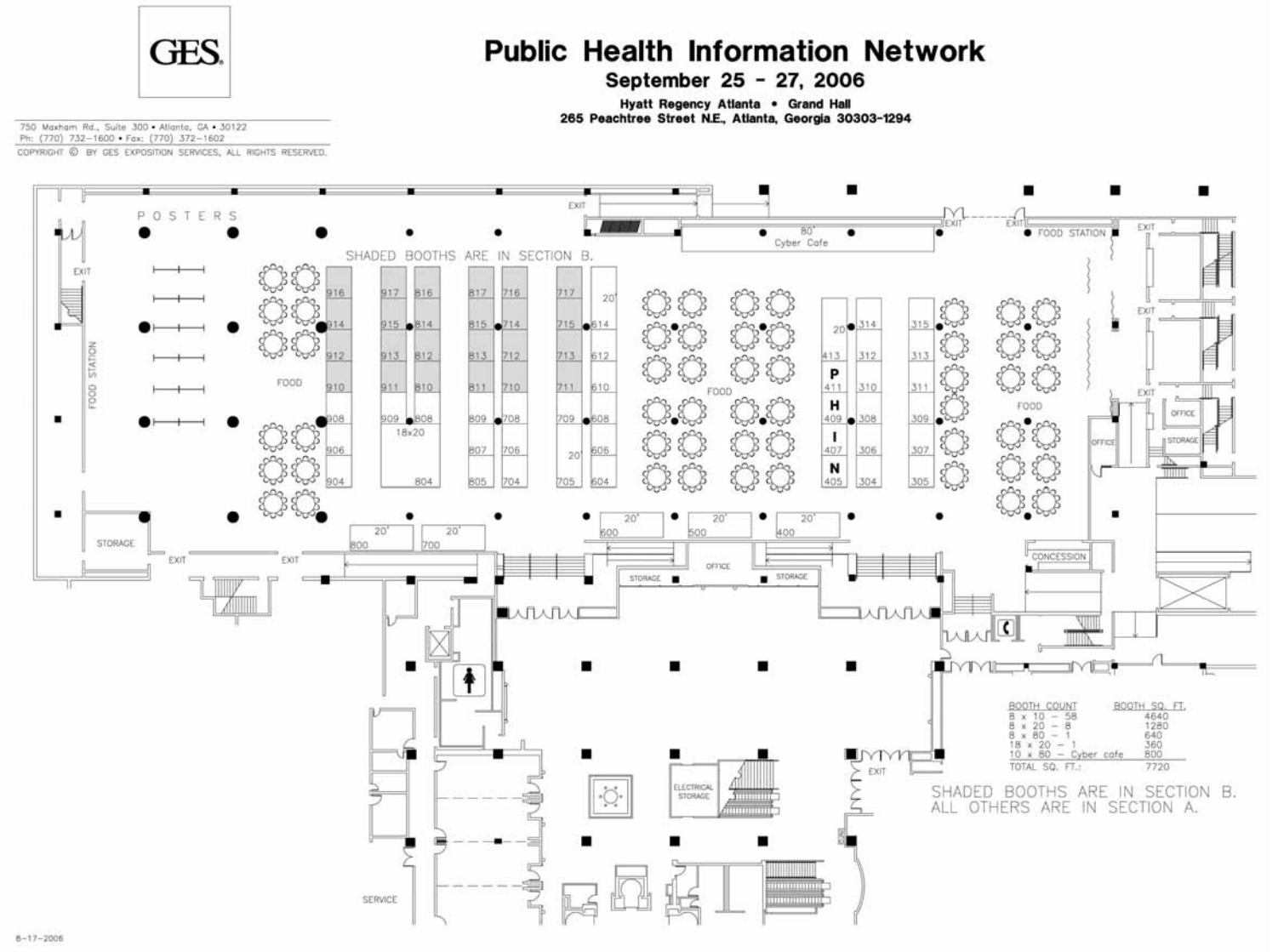
Business Process Analysis Workshop This is an open workshop presented by the National Association of County and City Health Officials (NACCHO). It will be held on **Thursday, September 28, 2006 from 8:00 a.m.- 12:00 p.m. in Hanover room C** of the Hyatt Regency Atlanta. Collaborative business process analysis is the key to developing information systems that support the work of all public health agencies. The purpose of the workshop is to explain why and demonstrate how local health departments are using the tools of business process analysis to define and redesign their processes to improve quality and performance.

You know WHAT you do. Now learn to describe HOW you deliver the public health services that promote health and protect your community from health threats. Colleagues from local public health departments and staff from the Public Health Informatics Institute will demonstrate:

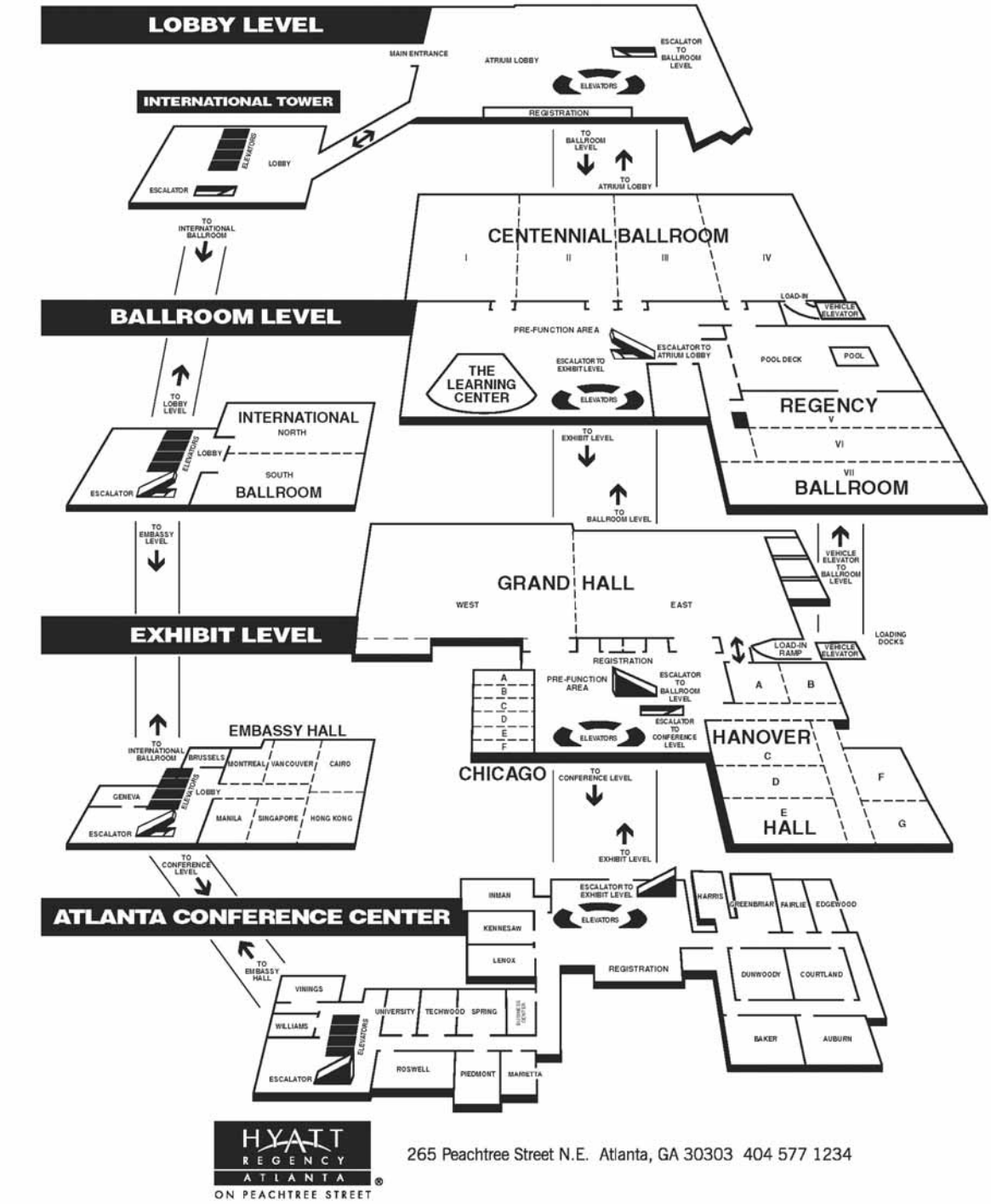
- How to use simple tools that enable common understanding of public health activities.
- How to think through the tasks that are performed to meet specific public health objectives (business process analysis).
- How to rethink the tasks to increase effectiveness and efficiency (business process redesign).

Sponsored by:
National Association of County & City Health Officials
Public Health Informatics Institute

The Hyatt Regency Atlanta Grand Hall, Atlanta GA



The Hyatt Regency Atlanta, Atlanta GA



HYATT REGENCY ATLANTA ON PEACHTREE STREET®

265 Peachtree Street N.E. Atlanta, GA 30303 404 577 1234